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THE SANITARY ENGINEER PLUMBER & STEAM FITTER of CANADA

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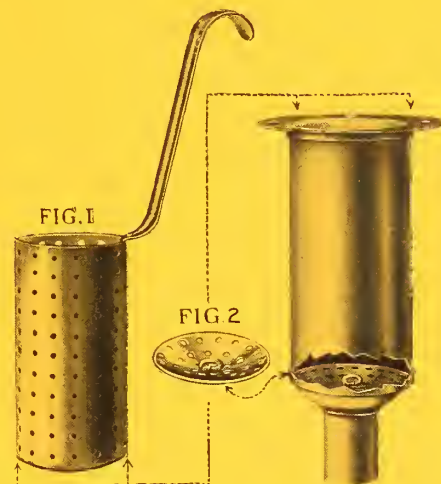
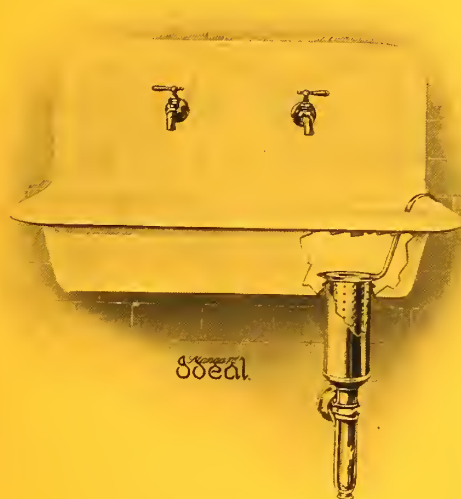
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Vol. VIII.

Publication Office : TORONTO, JANUARY 1, 1914

No. 1

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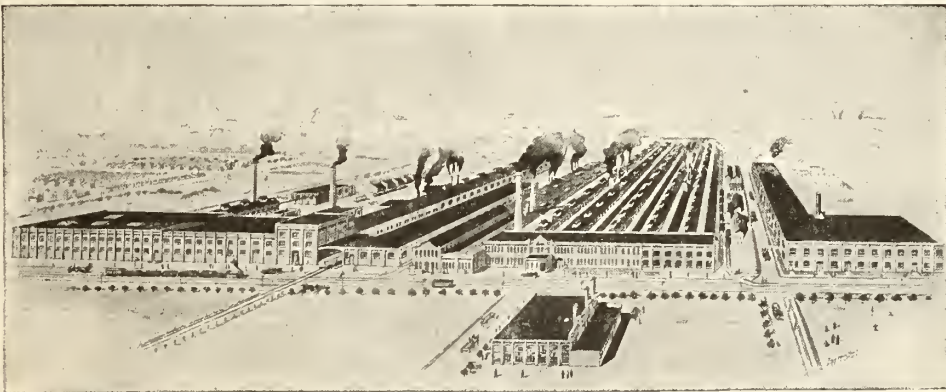
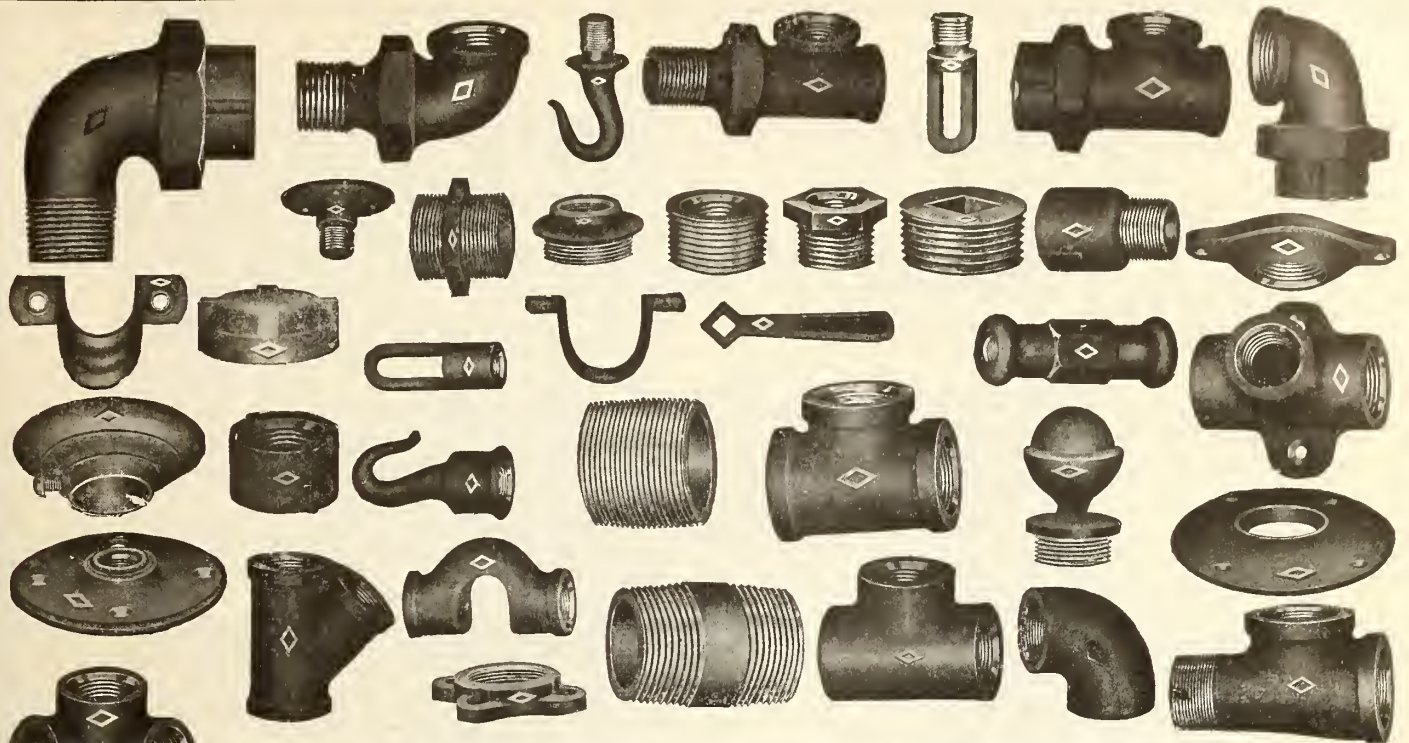
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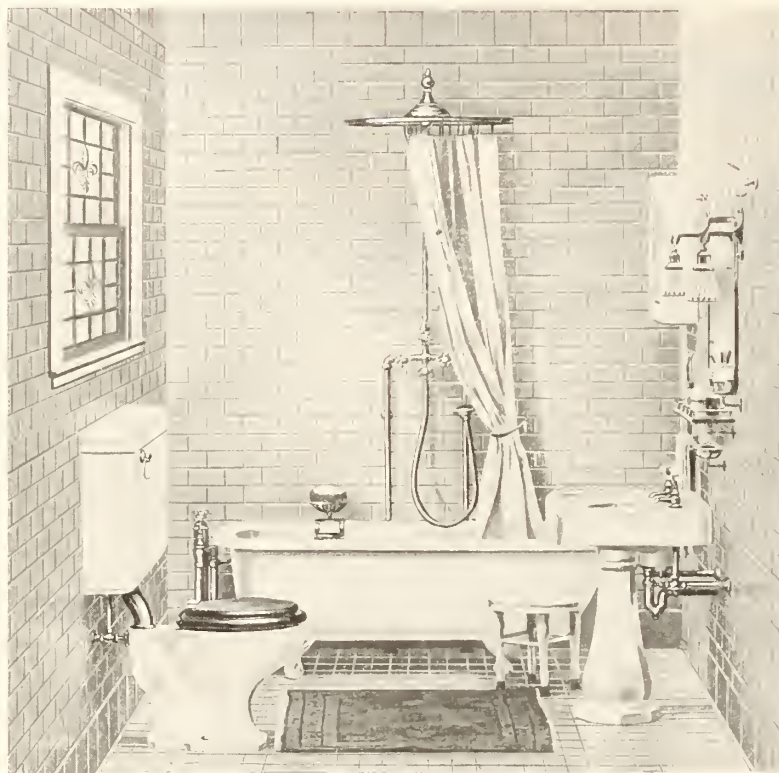
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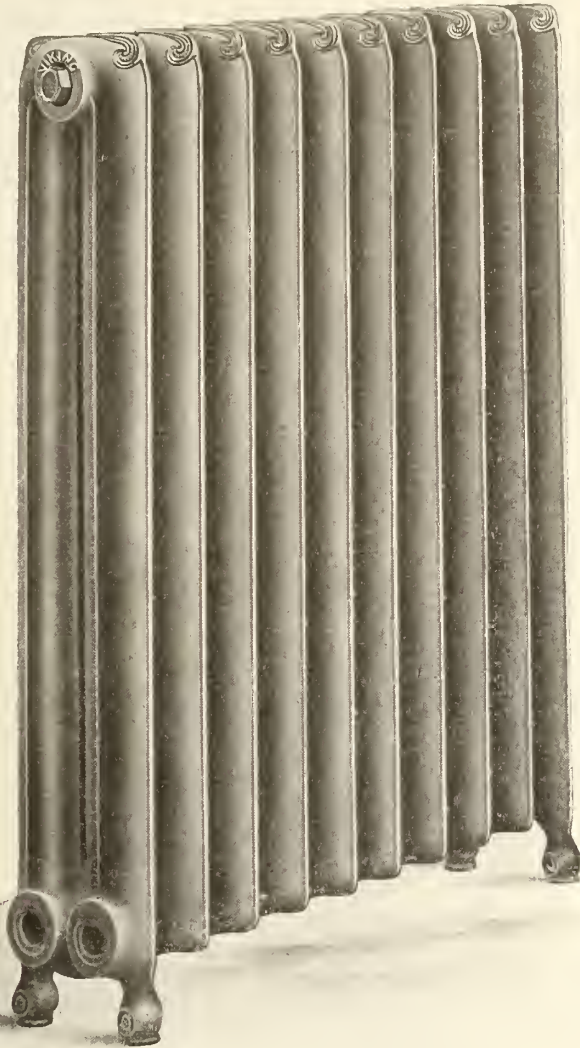
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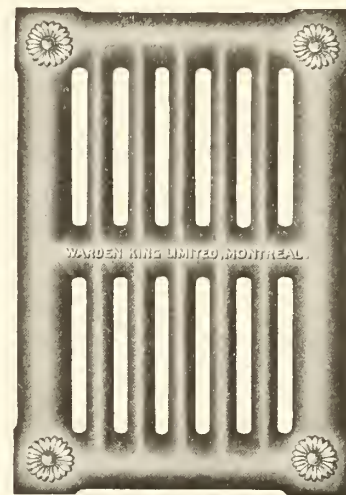


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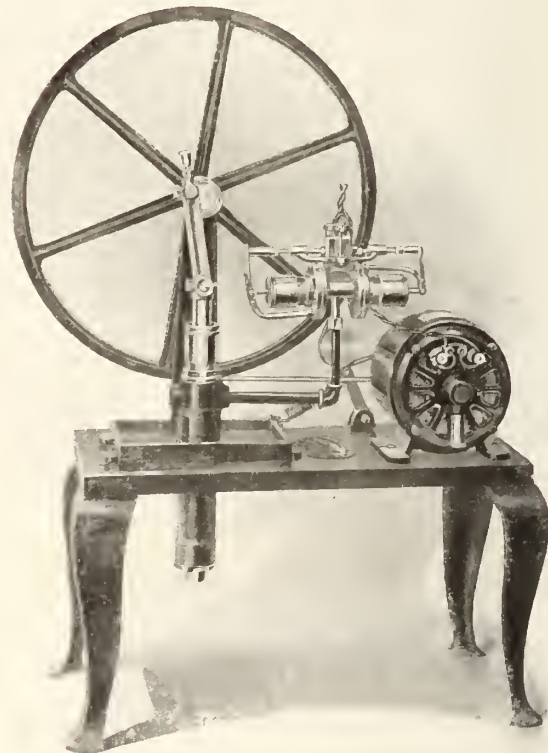
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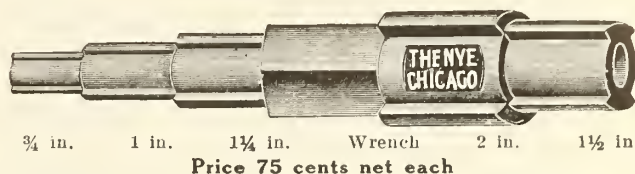
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PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, JANUARY 1, 1914

No. 1

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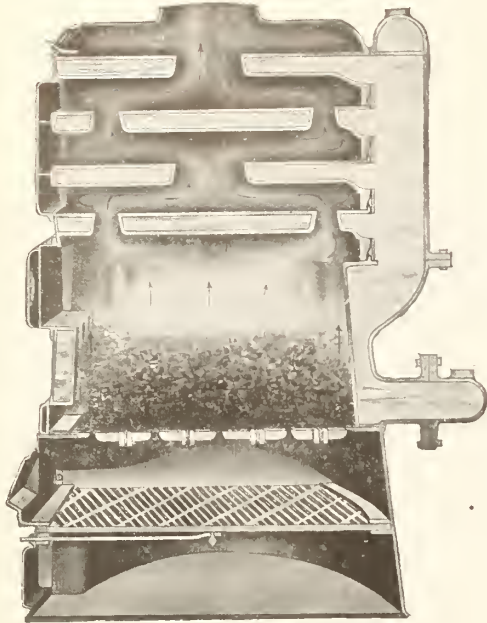
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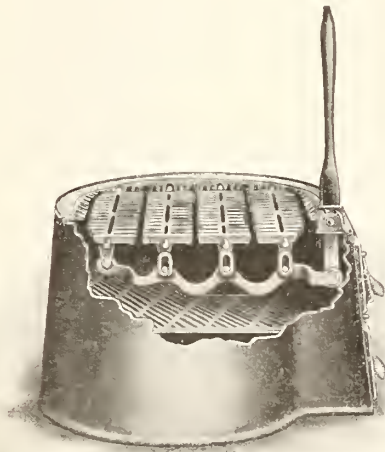
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THE SANITARY ENGINEER

VOL. VIII.

JANUARY 1, 1914.

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Sanitary Engineers: Why and by Whom Authorized?

Taking up a Much Vexed Question Which Should be Attended to by Our Civic Authorities, Respecting Examinations, Licenses and Permits—These Matters Should be Under the Jurisdiction of the Board of Health.

At a recent meeting of the City of Toronto Board of Health, the worthy health officer (Dr. Hastings), gave out a couple of surprises we are told.

First, an overdraft. Second, the growing evil of overcrowding of lodging houses, tenements and even private houses. The latter is to be regretted, and from the sanitary engineer's standpoint is one which, from the business side is not interesting except that if more houses were erected, as a natural course of events they would reap at the business end of it.

However, we are more interested in the first matter, viz.: that of the overdraft, which we are told amounted to \$23,000, hence we wish to review the whole matter from the sanitary engineer's standpoint. In the first place there are 514 licensed plumbers in the city of Toronto. There are, we are told, nine plumbing inspectors, and three drain inspectors, besides the army of other officials which one sees in that particular portion of the City Hall, where permits are granted, allowing such work to be done. And, we feel there are none too many by any means.

But, let us go back a little, 514 licenses are issued by whom? Why, the license department of course, and it costs the city more to actually collect those licenses than they receive, viz. \$1.00 each. Then, what is this license in force for? We are told to authorize persons to engage in the installation of plumbing or sanitary engineering. Well, so far so good. What are the qualifications necessary, which justify the license department in granting this authority? NONE, except that the applicant for a license must own a kit of tools and have a work-bench at some establishment. That's all. Thus any botch may engage in the plumbing business, and these same state of affairs are in existence in most of our Canadian cities to-day.

WHY THE LICENSE DEPARTMENT?

We yet fail to see why these

licenses should be granted from the license department. Even if the most rigid examination were necessary, how would that department know who were or who were not capable of doing such kind of work? Though this license department grant the license, they cannot enforce it. The enforcing has to be done by the Board of Health. Not very long ago a certain plumbing inspector voiced this grievance to the writer in these terms when speaking on this subject as far back as nine years ago. He stated that the license department granted licenses to anyone who owned a kit of tools and bench. Then in the ordinary course the holder of the license applied to the health office for a permit to instal certain work. The health department would grant the permit, which is only right and proper. Then a notice would be sent in to have the work inspected. The inspector would pay his visit, examine the work and find it installed contrary to the regulations embodied in the by-laws governing such work. Not only so, but poor workmanship as well would be found. In some cases it may be installed in proper design, but with poor work. In other cases the work may be found to be faked in a thousand and one ways to pass the test.

None But Competent Men Should Be Granted Licenses.

It has been said that to force each applicant for a plumber's license to pass an examination would be a hardship upon quite a large number of men who were earnest workers, etc., and knew to some extent the natural laws of sanitation, but who had not received the necessary schooling to enable them to pass any form of examination which would be of any value, either from a protective or technical standpoint, which in the end would guard the public to any great extent.

It has also been stated that quite a large number of men with a capital en-

ter upon the business purely from a business standpoint and employ men to execute such work as plumbing and heating, etc.

To the first question we may remark that while it may be to a certain extent a hardship to the few who wish to engage in the trade, what about the thousands who are going to jeopardize their lives by living in houses or working in factories and offices where work has been installed which barely stands the tests called for, and which in a very short time will be very unsanitary? Not only is that question to be considered, but is it honest to the public? Is it honest to the present employers who are striving to keep the standard of efficiency at a fair level?

The next class are easily dealt with, by including a clause in our by-laws which would require a competent man to be employed by such business men, though we feel that a person who is risking his capital in such an enterprise would not do so unless he employed competent men.

In Toronto there are nine plumbing inspectors and three inspectors of drains. The first named have to inspect the work installed, see the actual test applied and finally pass the work.

In some cases the size or peculiar layout of the installation requires several visits. But we know there are far too many inspections made on account of those who are authorized by the license department not being sufficiently competent. Hence the health department of the city is paying for this wanton inefficiency.

The Only Remedy.

This state of affairs would not be if the matter were taken in hand by our civic authorities. First, these licenses should be issued only by the Board of Health. And to make this statement more clear, let us draw a picture. We as a whole have every respect and faith in any decision arrived at by our

worthy medical health officer. Now, let us suppose a person in Toronto was to assume that he knew a little about the physical make-up of humanity, and on that assumption he put out a sign claiming he was a medical man and solicited business as a medical practitioner. Can we imagine Dr. Hastings allowing him to carry on his work? And, more, suppose this person had done so without notice being brought before our M.H.O. and some person had suffered as the results of wrong treatment, what then would happen? Why, he would be brought up for manslaughter. Yet this is exactly what is being done every day by allowing men to get licenses from irresponsible departments.

The license department is not responsible for poor plumbing installations. Hence, why should they have the authority to issue licenses to irresponsible and incapable men?

The Board of Health Should Grant These Licenses.

A man may apply for a license and become authorized to instal plumbing by receiving that license, which cost the magnificent sum of one dollar, and no other qualifications are necessary. It costs two dollars for a dog license, and a thousand and one qualifications must be wrapped up in that canine commodity, and, failing such qualifications, instead of a license being granted, it gets lead and loses its life. Therefore, any fool in the world can become authorized to not only live, but can actually be permitted by law to erect poor work, which in a very short time will not only be out of date, but will be a public menace as long as it exists, all for the sum of \$1. The situation is disgraceful, to say the least. Whereas if the Board of Health had the issuing of these licenses, a fairly strict examination was enforced, and a good stiff fee charged to cover the expenses of the inspectors of this class of work, the public would get better results and smaller sized over-drafts.

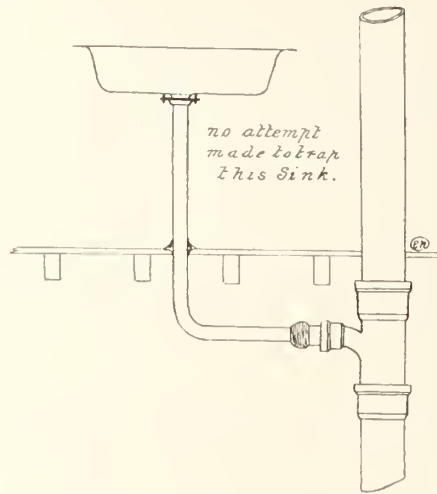
What Other Canadian Cities Demand.

We are here reproducing a portion of the by-law in operation in Calgary, and Edmonton has a similar one except that a certain amount of marks of efficiency are necessary before a license is granted. We shall, however, treat these different by-laws in future issues.

This by-law which in Calgary is known as City of Calgary Plumbing By-law No. 1531, is about the most recent to be issued as far as we are aware with the exception of the Toronto by-law. It is crowded with novel features; at a glance one can see points embodied that are not combined in other by-laws of the same nature. For instance: Clause 2 states that an application shall be made to the Board of Examiners for an ex-

amination as to qualifications of the applicant and reads as follows:

Clause 2.—Any person desiring to follow, engage in, or work at the trade or occupation of plumbing in



the city of Calgary shall first make application to the Board of Examiners hereinafter provided for and shall at all time and place as such board shall designate undergo such examination as to his qualifications and competency as the Board of Examiners may direct.

Clause 3 refers in a sense to Clause 2, and reads:

There shall be deposited with each application for a master or employing plumber's examination

Clause 7 we find the definition as to the features the examinations will take, and will here reproduce it:

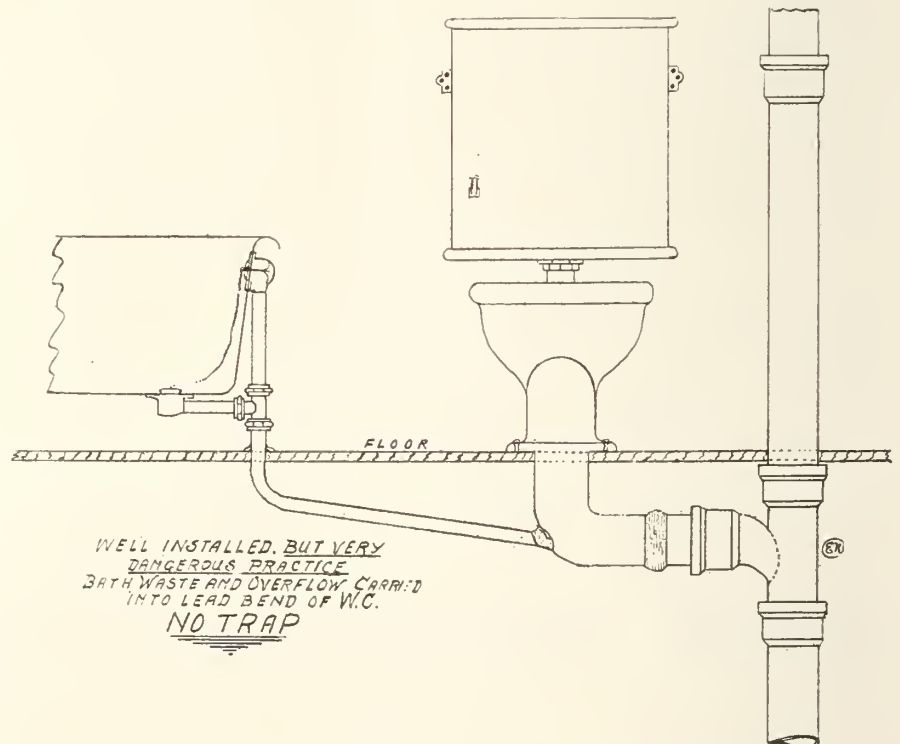
Said Board of Examiners shall within thirty (30) days after appointment of said members, meet and organize by the selection of a chairman and secretary, and they shall designate the time and place for the examination of all applicants for license.

Said board shall examine the applicants as to their practical and theoretical knowledge of plumbing, house drainage, and ventilation, and also as to their knowledge of the by-laws of the city regulating such work.

Such examination shall be made in whole or in part in writing.

If satisfied as to the competency of the applicant the board shall so certify to the license inspector for the city of Calgary, and such inspector shall thereupon issue to such applicant a license in accordance with such certificate authorizing him to follow, engage in or work at the trade or occupation of plumbing, either as master or employing plumber or as a journeyman plumber of the city of Calgary.

The fee for the license of a master or employing plumber shall be twenty dollars (\$20.00); for a journeyman plumber it shall be two dollars (\$2.00); said license shall be renewed annually upon payment of



the sum of Five Dollars (\$5.00) and for each journeyman plumber's examination the sum of One Dollar (\$1.00) as an examination fee.

five dollars (\$5.00) for the master or employing plumber, and one dollar (\$1.00) for the journeyman plumber.

Clause 10 reads as follows, and is a very commendable one:

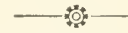
The license herein provided for of any master or journeyman plumber may at any time be revoked for incompetency, or dereliction of duty or fraudulent use thereof, after a full and fair hearing by a majority of the Examining Board, but an appeal may be made from said Examining Board to the Board of Health, whose decision shall be final.

This clause not only guards the public, but it also causes the mechanic to

stand the different tests, are anything but good workmanship.

We are sure if such a by-law were in force and enforced in the city of Toronto greater protection would result, the public welfare would be guarded, and less botch work installed in the first place. Such work costs the city of Toronto a lot of money in time wasted by inspectors having to make too many inspections, which if competent men only were allowed to hold licenses would be avoided. Then, again, the fee should be raised from one dollar to, say, \$25.00, or even up to \$100.00, according to the num-

\$514, when it might just as easily have \$12,850 at the rate of \$25 per license. Such a sum would help to curtail these overdrafts; and, not only so, but the public would be getting better work all through, and inspectors would have less calls to make. We have reproduced a few sketches of work which has been recently found by inspectors in different parts of Canada. These installations speak for themselves and go to prove who should issue the plumber's license, that he should be a qualified mechanic in every sense of the word.



A CASE OF TWO IN ONE.

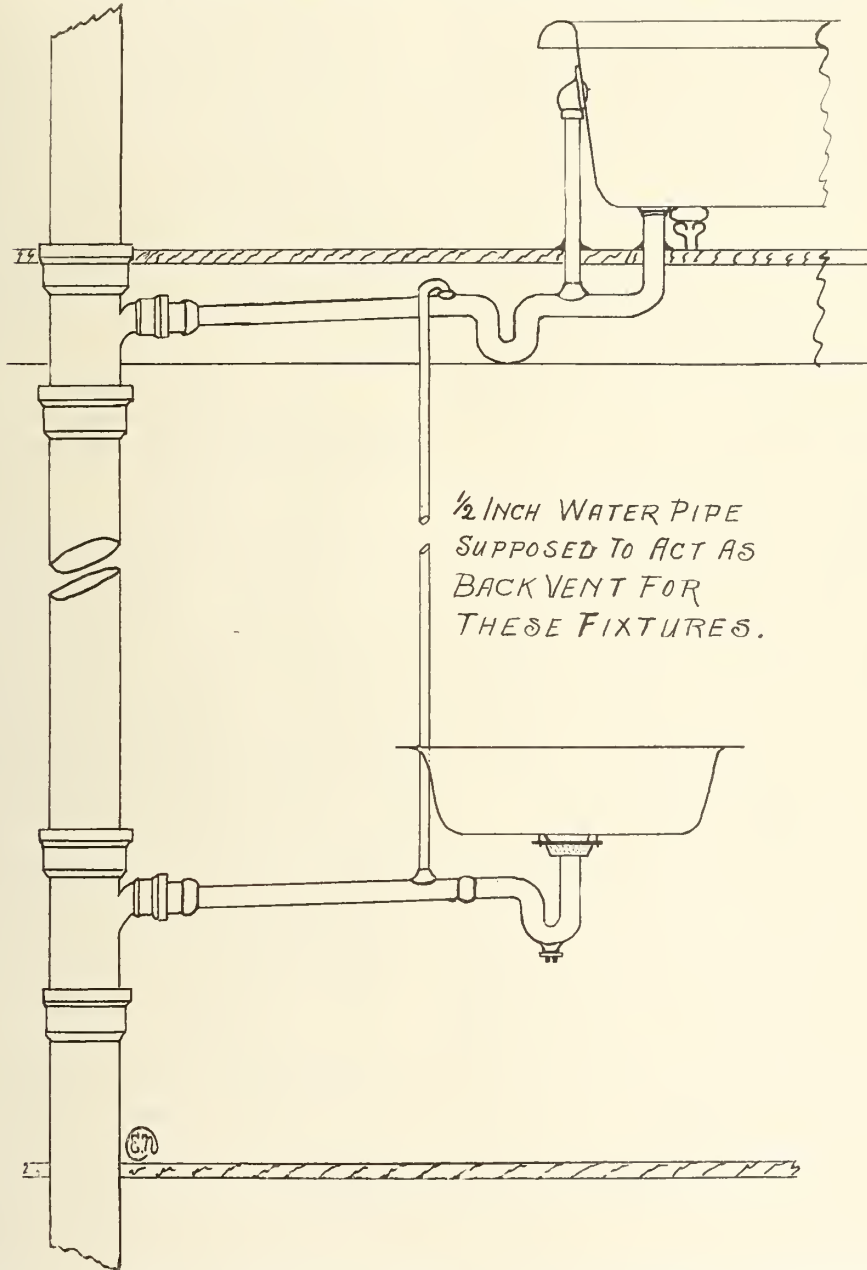
There are very few people engaged in the sanitary and heating business in and around Toronto but what have met Will Jury. They know him to be a good fellow, too. When on business he is inclined to be of a rather serious turn of mind, because in that capacity he represents the Gurney Foundry Co., which



Misses Eleanor and Elaine Jury.

commodity is even better known than Jury.

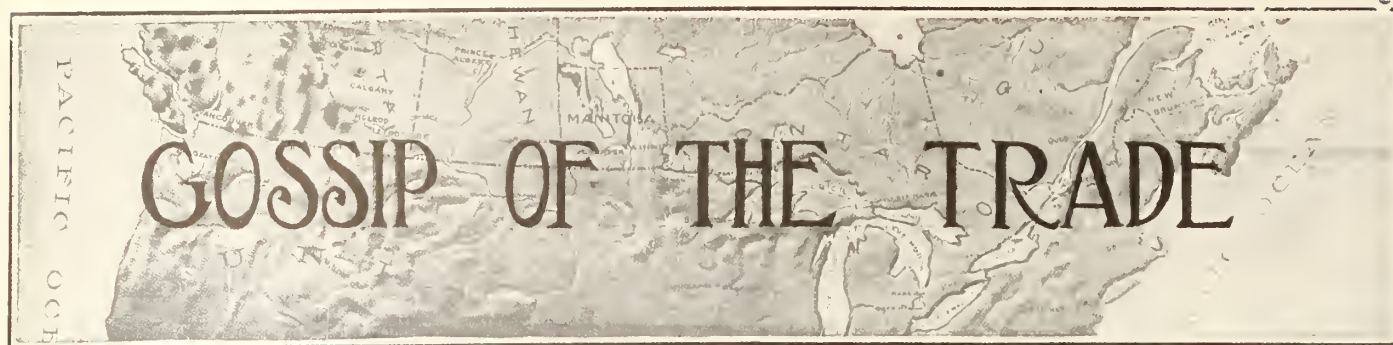
From time to time our snapshot artist has endeavored to get a snap of Will, but all to no purpose. Hence we are taking the liberty to have "Will" represented in the persons of Misses Eleanor and Elaine Jury, better known as "Jury's Twins." If you happened to meet "Will" on street or in the shop and he gets going about "boilers and rads," and you do not wish to prolong the discussion, just switch on to the Twins and watch his eyes. He will at once tell you there is only another parallel to those twins, and that is a pair of twin Gurney boilers, though he will take an oath on his twins as the winners against all comers. This photo was taken at the annual picnic of the Toronto Society of Sanitary and Heating Engineers held last summer at Berlin, Ont.



take more interest in his work, hence creating a higher efficiency in the craft, no man knowing that by carelessness, or shall we say disinterestedness, he is liable to forfeit his license, will persist in doing poor work, but will rather strive to attain a higher standing with the craft. This is desirable, as we know of lots of work that while being able to

ber of men employed. Sanitary engineers as a whole can afford to pay such a fee.

They don't find it a hardship in a city like Calgary or Winnipeg, Edmonton, etc. Why should they not pay it here? In the earlier part of this article we stated the fact that 514 licenses were in existence, and the city only receives



B. F. STURTEVANT CO. OF CANADA, LIMITED.

One of the largest manufacturers from across the border locating in Canada this year is the B. F. Sturtevant Co., of Boston, Mass., who have been incorporated as the B. F. Sturtevant Co., of Canada, Ltd., and have established a new plant at Galt, Ont. The company are at present only manufacturing heating and ventilating systems for the Canadian market, but the products will eventually be identical to those being manufactured at the Boston plant. The company have secured an option on ten acres and are occupying temporarily a brick building, 175 x 60 ft. It is highly probable that important developments will materialize in the spring and a start be made on a large plant to take care of the increasing demand for the company's products in this market.

The building is well equipped for making steel plate fans, heaters and blowers, and arrangements are being made to manufacture vacuum cleaners. Machinery suitable for this class of work has been installed and includes lathes, gate shears, drills, grinders and pipe threading machines. A 50 h.p. motor drives the line shaft and a steam-driven air compressor supplies compressed air for various purposes. In the rear of the main building is a blacksmiths' shop and a general storage, while at the front are the offices.

The plant at Galt is under the management of Mr. B. M. Chittick, who reports that business has been very satisfactory and that prospects for the future look bright. A head sales office has been opened in Montreal, and branch offices will be established in the more important cities in due course.

HEALTH OFFICIALS MET.

Sanitation Throughout Ontario Has Taken Forward Strides.

District officials in connection with the Provincial Board of Health have been in conclave at the Parliament Buildings, and the result has been to convince Dr. J. W. S. McCullough, secretary of the Provincial Board of Health, that much has been done in the

way of sanitary organization during the past year.

The actual condition of the various municipalities throughout the province, in regard to sewage, water and hospital accommodation was shown by figures and data presented, and it is expected that, at the next session of the Legislature, amendments to the Public Health Act may be presented as a consequence.



LONDON TO HAVE INSPECTOR OF PLUMBING AT LAST.

M.O.H. Ruttan informed the board that plumbers were installing closets without proper ventilation. Mr. S. G. McKay expressed the opinion that it was time that a plumbing by-law was passed here. It was pointed out that the Provincial Act required ventilators and plumbers should be required to live up to the Act. Action was deferred until the next Council meeting, when it is expected that a by-law appointing a joint plumbing and electrical inspector will be appointed. The need of an inspector of electrical wiring, etc., was commented upon.



NORTH BAY FIRE.

Damage to Extent of \$3,000 Done Through Upsetting of Pan of Grease.

The shop and residence of Harry E. Angle, plumber, were gutted by fire, which started in the kitchen. A pan of grease upsetting caught fire and spread over the floor. The contents of the house and workshop were badly damaged, while the building is gutted. Loss \$3,000, partly covered by insurance.



FIRE IN PLUMBING SHOP AT SARNIA.

Sarnia.—Fire at Filsinger's plumbing and electric shop called the firemen out at 7.10 this evening. The damage is about \$50, chiefly from smoke.

The ferry operated by Captain Egbert between Point Edward and Port Huron, will discontinue from the first of the year till spring. The burning of the Block 1 shops in Port Huron is responsible, as the ferry business came chiefly from Sarnia men going over to work.

New Fire Equipment.

The Standard Ideal Co., of Port Hope, are having a splendid fire extinguisher system installed which will be equipped with independent pumping apparatus, as well as supply from the municipal waterworks. The capacity may be judged when it will involve the fitting of 3,500 sprinkler heads. They are of the Grinnell style and the equipment is being installed by Messrs. Purdy Mansell Co., Ltd., of Toronto, under the superintendent of their expert Mr. C. T. Boddington.



BAD PLUMBING.

Hamilton Finds Tin Waste Pipes in the City Hall System.

A mix-up in the plumbing in his office which City Engineer Macallum hinted at as a bungle, came to light to-day. When part of the wall concealing the pipes leading from the second floor of the City Hall to the basement was torn off, the City Engineer discovered that the greater part of the waste main was of tin, and had been eaten away so that a large quantity of the pipe's contents splashed over the office and its furnishings, causing considerable damage. The City Engineer was further peeved when several workmen called in to make repairs smashed his private wash basin and did other damage.

An investigation will be made into the plumbing.



DAMAGE BY FIRE.

Serious Blaze at W. J. McClung's, Port Hope.

A disastrous fire occurred this morning at Mr. W. J. McClung's plumbing establishment. The work shop and the stable adjoining, were completely gutted and the roof of the building was completely demolished.



NEW MANAGER APPOINTED.

Fred W. Smith, formerly general manager and vice-president of the Shirley Radiator & Foundry Co., Indianapolis, has been appointed general manager of Steel & Radiation, Limited.

Sketches From An Inspector's Note Book

A Series of Articles Will Appear from Time to Time, Submitted by Men Who Are Holding Position of Inspectors. The Subject Will Be Treated Editorially.

SERIES 3.

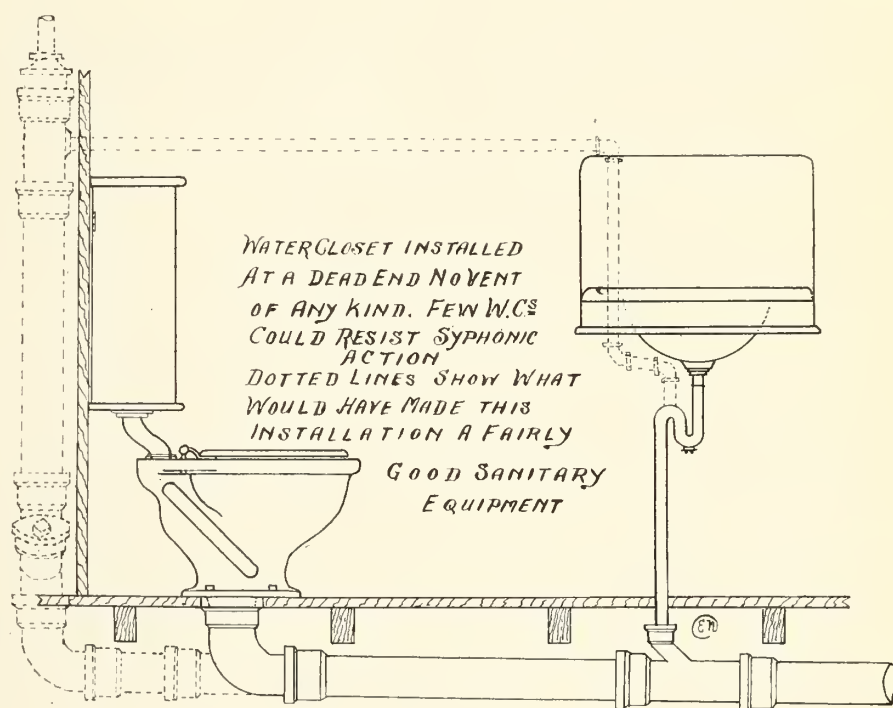
In this issue we are reproducing another sketch which has been submitted to us from an inspector's note book. Here is another instance of fairly good workmanship but absolutely void of either good theory or practice. No craftsman could possibly have learned his trade even to a small degree who could or would have installed such a job. Here is a W.C. connected to a dead end and in all likelihood with quite a number of feet of horizontal pipe connected to it and, while we do not know whether the main house trap is enforced in the locality where this was installed, we feel that if it was, then the lavatory trap would not only be subject to back pressure but also the syphonic action as well as the w.c. It all amounts to this, we in the craft should set aside a little more time to study, with a view of bettering not only those who are in the trade but also those who wish to learn the trade, and before we go any further, we should be careful not to carry things to extreme. We refer to the necessity of some examination. For those already practicing as journeymen, our efforts should be to give them all the encouragement we can to enable them to become more efficient in their calling as time goes along we should in choosing our workmen, endeavor to employ only those who are thoroughly interested in their profession. Nothing more to be detested than to see a member of our craft doing his work in a hang-dog kind of way, to be a successful sanitary engineer, one must be in sympathy with the trade, and must feel one's responsibility to the human race. There was a time when the boss plumber having a smart fellow in his employ became jealous and afraid that at some day he would become a competitor. This boss would try to hide all the knowledge he could from this fellow, but would only make matters worse by such tactics and it is our opinion that such mismanagement has to a certain extent caused many a man to start for himself before he was really in a position to do so. However, we hope such a feeling does not exist to-day, and that every employer will value any man who is trying to "do things" better by assisting him all he can. Then when time comes and this man starts in the business on his own account, these two individuals will have one common good at heart and will work together more amicably than the craft as a whole is doing at present.

Returning to the subject of our discussion on improper installation, we have shown how this could be improved by placing a T. Y. in place of a quarter bend, then connecting the dotted lines up as in manner shown. Though we would not recommend it being constructed in this manner if started from the first, (we would prefer the w.c. to be connected up with a Y laid on its side and a long sweep quarter bend placed in the Y.

However by showing the principle

to be looked up to instead of being the butt of every non-thinking man of the street.

Vancouver, B.C.—John W. Bruce, general organizer of the United Association of Plumbers and Steamfitters, spent two weeks on the coast, and while in Vancouver succeeded in strengthening the local movement by the addition of another local to the list. This was the chartering of the railroad pipe-fitters



which in proper practice is necessary, we hope that some good may result.

There are, however, two points which should be always kept in view when studying this need of practical study and these are: First, the apprentice or student should possess an earnest desire to become a sanitary engineer and be in thorough sympathy with all matters of sanitation. Second, there should be a series of examination papers prepared for the apprentice to take up and thoroughly master from time to time during his term of apprenticeship, thus allowing those of the coming generation to be thoroughly grounded into the principles both practical and theoretical which are embodied in domestic sanitary engineering. These our followers will then and then only be practical men and further they will eventually become men who are

and helpers employed in the local C.P.R. shops, which completed the chain of locals in the Western Canadian railway system. The new union will be known as Local No. 632, and will have jurisdiction over railroad pipe-fitters between Vancouver and Calgary. Considering conditions, Mr. Bruce says the members of his organization are holding together and maintaining their schedules as well as could be expected.

William Paton, for a number of years secretary of the local plumbers' union, has gone to San Diego, Cal., for his health.

P. Barron, one of the popular members of the Vancouver Plumbers Union, has gone on a trip to the Old Country. When he returns in about a couple of months he will have a life helper.

R. B. B.

The Sanitary Engineer

Plumber and Steamfitter of Canada

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TORONTO, JANUARY 1, 1914

INSPIRATION AND SANITARY ENGINEERS.

A great many people have the idea that inspiration and inspirational accomplishments were and are belonging to the sentimentally inclined, that inspiration ceased when St. John finished the book of Revelation. We are apt to look upon the Bible as an inspired book, and so on. Well, let us here state, all books are more or less works of inspiration, if what we read is of an honest nature. Even our advertisements should be inspired. If they are not, then they are false. They are empty and void, and the goods advertised are not getting justice. The customer is not getting a fair honest analysis of the goods. Our works should be full of inspiration. We sanitary and heating engineers should be the most inspired body of men on the face of the earth and there are lots who are. If some in our trade were backed by the laws of the country, we should see and feel such a flow of downright inspiration as never before existed.

Works of Inspiration.

In our March issue of last year we wrote an article read by John T. Aggett, a well-known member of the Toronto craft, entitled, "A Short History of Sanitation." This whole article shows a great volume of inspiration. These ancients as far back as Moses were inspired with the thought that sanitation was needful. King Hezekiah saw great works for the supplying of water accomplished in his day. The Romans at the time when Rome was at her height of prosperity solved problems of a sanitary nature, and built large works for supplying of water and so on. Though we do not hear of much being done until about the sixteenth century, when Newton gave the world his theory on the laws of gravitation, it was pure and simple his contribution of inspiration. When James Watt sat before the fire and played with a spoon at the kettle spout, was it idle thought? No, readers, it was inspiration. What have been the results? Will the inspiration which James Watt gave to the world ever die? We think not. We sanitary engineers should and must put more inspiration and individuality in our works, if we wish to leave creditable accomplishments in our train. Sanitation is the beginning of all things. Works of sanitation which

lack inspiration will be short lived and dangerous. Sanitation needs those who are inspired with their calling to put forth all that is good into their work, so that these works will live and not die, will be a world-wide blessing to humanity and not a lasting curse.

Hence we ask those engaged in the craft to consider the inspirational side of our calling during the year 1914, and put it into actual practice.



SANITARY ENGINEERS AND CIVIC MANAGEMENT.

At this season of the year one is brought face to face with an election in their town. Long before this period, there are quite a number of men chosen as candidates to fill the position of Aldermen, Member of the Board of Control or Mayor.

At these meetings where candidates are chosen, what class of men are present? Are they men who could be relied upon as a whole to have fair, honest and unbiased opinions? Are they men who have the welfare of the city at heart, or are they men who simply have some other motive in view and wish to see a certain man elected?

Where is the city in Canada to-day that is not in trouble as a direct result of neglect or ignorance in sanitary matters? We fail to know one, and what is the reason? Simply this:

There are very few sanitary engineers appointed to office in our civic matters. We sanitary engineers are practical men, no enterprise will pay such compound interest as good sanitation. Hence we should be represented on the boards of health, on our boards of control as well as in the engineering departments.

In another article we are showing some of the actual matters in civic management which the sanitary engineer could remedy if they were represented on either board of health or control. Some of these matters are foolish to say the least. Let us cite one or two. At present anyone can get a master plumber's license in a number of our Canadian cities irrespective of qualifications. He has simply to apply in person, pay the fee, which by the way ranges from \$1.00 to \$5.00, and in the eyes of the public

he is a licensed, qualified plumber. He has authority from the "City Fathers" to practice in the trade. He is permitted to instal work which requires in many cases as many as seven visits from the plumbing inspector. Whereas, if these men who are elected to positions on Boards of Health or Boards of Control, were practical men, such conditions would not exist.

Just imagine a city Health Department having to send their plumbing inspector seven times to inspect a job done by one of these men. No wonder we find a large overdraft each year in almost every financial report from our Health Department.

There we would urge those who are engaged in the craft to become more public spirited. Voice their ideas regarding these matters and finally become candidates to fill such civic positions.

THE HEIGHT OF FOLLY.

Much has been said from time to time regarding the qualifications necessary to become a licensed sanitary engineer, one who is granted authority to instal works of a sanitary engineering nature in our homes and other buildings.

Plumbers License\$1.00

Dog License\$2.00

Here is a case. Not long ago one of the craft, who by the way has been in the business for quite a number of years, but who had to apply for a license, went to one of our Canadian City Halls and asked for a dog license (this is a fact). The official who granted such licenses looked the man up and down, then asked the applicant the following: What breed of a dog is it? How old is it? Has it ever bitten anyone? etc., etc., and after being satisfied that the dog was O.K., said: "Alright, \$2.00 please."

The plumber had come away from home with no more than a one dollar bill in his pocket, and at once stated the fact. But says he, "I'll take a plumbers license," was then asked for \$1.00 and went on his way rejoicing. No question as to whether he was a qualified plumber was asked. He wasn't even asked if he'd ever bitten anyone, (and according to public opinion they feel they're often being bitten) this man wasn't even asked if he was fond of children. No, he was able to get authority to instal work of the most vital importance, which, if not installed properly, would play worse havoc than all the dogs that ever existed could do, providing each had to bite one person and that person went mad. Hence we feel it is a joke which is misleading the public in a serious manner, to allow anyone to get a plumber's license without any examination of any kind and for the small sum of \$1.00. In Toronto one dog license—two plumber's licenses.

GOOD WORK BEING DONE.

Already we are receiving press reports that members of the Royal Sanitary Institute are doing good work. It is a pleasure to us all to see any missionary work being done as no craft or calling requires more assistance and sympathy than sanitary engineers. We need pulling out of the mire, as it were. We need laws forbidding poor installations, thus raising our laws on sanitation to a higher level, which when attained, will demand a higher grade of efficiency from those in our craft.

MAY BE AMENDMENTS TO THE PROVINCIAL PUBLIC HEALTH ACT.

In another column is reported that a meeting of the district officials connected with the Provincial Board of Health took place recently and several matters were discussed of a sanitary nature and at the close it was stated that it may be expected to forward some amendments to the Public Health Act to be presented at the next session of the Legislature.

This should be interesting to sanitary engineers, and if there are any matters bearing upon construction details, they should be getting busy.

No doubt our Provincial Health Officer will meet any suggestions at this time for the general improvement in the construction of work such as is carried on by our craft. So "get busy."

EDITORIAL COMMENTS.

Welcome 1914. May it be a Happy New Year.

Don't make too many cast iron resolutions. It's too frosty these days, and cast iron breaks easily.

Don't make pie crust resolutions because: They are made to be broken.

Make a few such as these and keep them.

Don't cut prices.

Don't think you can do the job as cheap at such and such a price, because one of your competitors has given a lower price in than you.

Individualize your work so that your accomplishments will command your price.

Put a name plate on every new installation or fixture.

Clean Up Your Stock During Dull Times

A Voice From the Provincial Domestic Sanitary and Heating Association

To our Brother Craftsmen in the Province of Ontario:—Ring out the old, ring in the new, forget the past, ring in the true. The year is dying let it die, the past is gone with all its faults and with all its truths. A better day is dawning, a larger measure of responsibility is ours, a demand that we measure up to this new responsibility is being forced on us unconsciously, by the force of enlightened public opinion who are conscious of the importance of private and public sanitation. Is the Province becoming more healthy with a greatly increased population? Are the cities safer to live in to-day than in any past time? Why do the Dominion, the Provincial and the municipal Governments appoint officers of health, inspectors, commissioners and spend large sums of money and for what purposes?

We are beginning to see that a life well fed, well clothed and well housed is an asset to our country. The preservation of health, the conservation of families, the gospel of cleanliness, the training of engineers and doctors to guard the health of the people is really the old philosophy of religion brought up to date and applied in its literal interpretation.



It has always been with us, but for lack of understanding we are just beginning to discover it. Is life and living a matter of being born, growing up and simply dying? Does it not carry with it some responsibilities to others? Of what use are we if we live to ourselves? Could we enjoy life living alone? Can we be our best selves living with others in this world and not associating ourselves with them? Have not men of like occupation some affinity to each other? And, can we not better improve conditions by contact with each other? Get the sharp edges worn smooth, the rough places filled in, the crooked places made straight and be enabled to adopt a policy of unselfish progression. We should work in conjunction with the Dominion, Provincial and Municipal authorities. A manly policy of causing injury to no man, a removal of red tapeism in health acts, and the applying of intelligent common sense to all questions dealing with municipal health requirements.

I am asking for the support of all men intelligently engaged in the domestic sanitary and heating business of Ontario to associate themselves with us, we need your support physically and financially. If you have any criticism to offer come among us, or want to see different men in office come and help us get the best. Don't ask someone else to do your work but rather do your own and help the other fellow do his. A great many men in the sanitary business seem to think that their support is not necessary for the success of any venture. It makes no matter what your business importance may be we want to associate with you for what you are, we want you to associate with us for what we are. The present members and officers can do without association influences as well as you can, and not a bit better, and we believe that our association with others in the same calling are beneficial to us and we believe that those who are not associated with us are losing some of the results that come from friendly discussion, personal contact and a face to face examination of peculiar situations.

LEWIS LEGROW.

New Sanitary and Heating Goods

NEW FOLDER.

Messrs. Cluff Manufacturing Co. Ltd., have issued a new folder containing a number of testimonials which speaks very highly of their new product "The VITRO NO TROUBLE w.c. tank." We are informed this company are now making these tanks in Canada. Those desiring to read more about them may acquire one of these folders by writing Messrs. Cluff Manufacturing Co., Ltd., Sterling Road, Toronto.



BECKER-RECEDING PIPE THREADER.

The most recent product of the Handy Manufacturing Co., the Becker-Receding pipe threader, is being placed on the Canadian market by Henderson & Richardson, Board of Trade building, Montreal.

The Becker-Receding pipe threader is claimed to be a new departure in cutting pipe threads, as it introduces the roller bearing principle of overcoming friction in the threading of pipe.

This innovation is accomplished by the combination of the roller nose lever and the floating ring movement.

The narrow dies rest against the roller nose lever, and as the floating ring movement is drawn nearer to the top of the tool it permits the lever to roll backwards and the dies follow the roller so

as to produce a perfect taper thread with a minimum of friction.

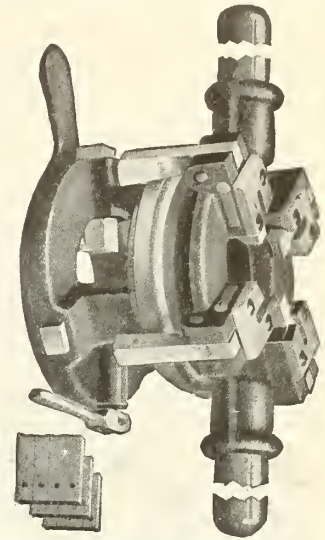
The dies are made of high-grade crucible steel for threading steel pipe.

The other wearing parts of the tool, the roller nose lever and the chuck jaws, are made of the same crucible steel, and are hardened and drawn, as are the dies.

While the dies furnished with the pipe threader are of the narrow receding type, the heavy pulling at the start is partly eliminated by having two leading

made of the best grade of malleable iron; no cast iron is used in its construction.

The Becker-Receding pipe threader is offered to the trade for threading pipe



Becker—Receder Threader.

from one to two inches. It also accommodates $\frac{1}{2}$ in. and $\frac{1}{4}$ in. by omitting the leading screw. This gives this tool an extreme range from $\frac{1}{2}$ to 2 inches.



SUPERIOR SAFE GARAGE HEATER.

The Superior Manufacturing Co., N. S. Pittsburgh, Pa., are offering to the Canadian trade the Superior Safe Garage Heater here illustrated.

The manufacturers claim that the heater is designed to provide a garage heater that is absolutely safe and reliable.

The ever present danger of explosion and fire due to the proximity of gasoline has prevented many persons from properly heating their garages, with the result that numerous excellent machines have been damaged or ruined by freezing.

The heater is a small furnace consisting of a combustion chamber and tubular radiator inside of heavy galvanized casing, the outside dimensions of same being: length 40 inches, height 33 inches, width 12 inches. It will thus be seen it is designed to occupy the least amount of space. The combustion chamber contains one of the Superior single piece cast iron burners, a basket of patent English artificial fuel and a small pilot light.

teeth in front of the full thread teeth. These first teeth will reduce the thickness of the pipe gradually, and it is claimed will make the tool easy leading on as well as light pulling at the finish of the thread.

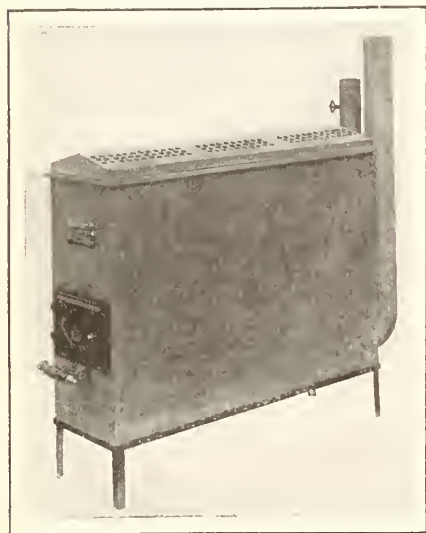
The Becker self-locking universal chuck is furnished with this new pipe threader. This self-locking universal chuck will pass the coupling of the largest size which the tool will thread. Close threads and drip threads can be cut. The chuck is operated by pulling the lever over hard enough to engage the chuck jaws on the pipe. They are universal and self-locking. It will also thread $\frac{1}{2}$ in. and $\frac{3}{4}$ in. pipe. When threading these sizes the leading screw is not used.

The entire body of the stock, both the work holder as well as the die holder, is

Perfect combustion takes place inside this chamber and every unit of heat is liberated ere the products of combustion escape by the exit pipe.

All the air consumed in the furnace is conveyed into the combustion chamber through an intake pipe from a safe place above or outside the building, thus insuring absolute safety from contact with explosive and inflammable gases generally found in garages.

It is claimed that no gases or air from the inside of the building can possibly enter the heater at any time. The heater is provided with a safety locking, gas proof door which need be opened but once during the cold season to light the pilot which uses so little gas as to not



Superior Safety Garage Heater.

deserve consideration. To obtain the heat desired it is only necessary to give the valve handle a turn. An adjustable spud is attached to the valve and this regulates the flame and gas pressure at all times so that there is no danger of over heating when left to burn over night.

No matches are needed after first lighting, hence the danger attending their use is removed.

A small circular window in the centre of the door enables you to see the condition of the fire inside at any time. The window is made of mica carefully protected with safety gauze wire.

The makers claim that the heater can be as easily installed as a common gas stove. It is supported by feet but may be set upon brackets at the option of the owner.

The makers also claim that the heater will prevent the freezing up of radiators, and other parts, and also causes mud, ice and snow to drop from the auto.

NEW BOOKS.

Messrs. Thomas & Smith, Inc., Chicago, have recently issued a new book entitled "Economy Pumping Machinery." It is well gotten up and contains a volume of useful information for the sanitary and heating engineer. Such books are to say the least an education in themselves, and should be read by all interested in this respective line. Anyone desiring to procure one of these books may do so by applying to Messrs. Thomas & Smith, Inc., 116 and 118 N. Carpenter St., Chicago, Ill.

The Dominion Radiator Co., Ltd., are distributing a very attractive as well as instructive book entitled "Home Heating. For Health, Comfort & Economy." It is printed in two colors and demonstrates their products in a very modest way. Showing the different stages the heating problem has passed through from the old open fire place, burning logs, etc., and showing in simple form stage after stage. Those interested in the heating problem should apply for one of these books which can be procured by writing The Dominion Radiator Co., Ltd., Toronto.



AN UNUSUAL MESSAGE.

At this season of the year we hear of Christmas messages, New Year messages, telephone messages and a thousand and one other kind, all of a usual nature. The C. A. Dunham Co., Ltd., of Toronto, have informed us that they propose to send out a very interesting pamphlet entitled, "An Unusual Message," to every sanitary and heating engineer in Canada, and those who do not receive one within 30 days should write and procure one from the C. A. Dunham Co., Ltd., Davenport and Primrose Avenues, Toronto.



ROBERTSON'S SANITARY TOPICS.

Messrs. James Robertson Co., Ltd., Toronto, are now distributing a very attractive pamphlet entitled, Robertson's Sanitary Topics. It is nicely gotten up in every way. It deals not only with very interesting topics of the trade, but also puts before its readers their products. It is issued monthly, and should be read by all interested in sanitary goods. Drop a post card to the Jas. Robertson Co., Ltd., Toronto, and procure one.



PREVENTING THE SPREAD OF FLAMES IN THE FACTORY.

In spite of the advent of so-called "fireproof" factory buildings, the days of factory tragedies have not yet passed, as evidenced by recent disasters in more than one of our large cities.

To this end many extinguishers have been put on the market, some of them highly efficient and others, unfortunately, so complicated or difficult to use that they fail to fully meet the requirements of a serious emergency.

In strong contrast to extinguishers of the latter type is a device of recent invention which is creating considerable interest on account of its simplicity and efficiency.

This extinguisher, which is known as



the "J-M Fyro" discharges by means of compressed air a liquid gas said to be 40 times as effective as water. No mechanical force is required to operate it—there is no pumping, no tearing off of caps, no unscrewing of nuts, and no turning upside down.

All that is necessary is to hold it in an upright position and turn a small valve wheel about the size of a silver dollar. Its operation is so simple that a woman or child can use it.

This remarkable little fire-fighter (it measures only 3 x 15 inches) can be aimed and operated almost as accurately as the pointing of a finger, and it is largely due to this certainty of aim that it is so efficient, as none of the extinguishing fluid is wasted.

Anyone interested in such a unique apparatus may be supplied with full particulars, prices, etc., by applying to Messrs. Johns-Manville Co., Ltd., Toronto.



RIVAL TO DAMN FAMILY.

Ice Cream Manufacturer Named Hell Has Startling Sign.

The Damn family, of world fame, bids fair to lose its renown by discovery of the Hell family in the town of Farrell, Pa., built by the United States Steel Corporation.

Members of the Hell family are not averse to using their names in a business way. The head of the family, Conrad Hell, an ice cream manufacturer, has signs reading "Go to Hell for ice cream!" scattered throughout the city. Another sign reads:

"Have you been to Hell? It's the coolest place in Farrell."

"Shop Economics," a Talk With Boss, Journeyman and Helper

Showing Where Savings Could be Made, Where the Boss Would Save, Journeyman Earn and Helper Learn by Using the Methods at the Right Time.

In our last issue we began this series of "Shop Economics" and told of an incident where wood plugs had been used to fasten a roll rimmed sink and lavatory on a brick wall, and where the sink fell down. Then we went on to show what should have been used to prevent these accidents from happening. Well, the writer was surprised to be told by one of our craftsmen, that he had never seen such a thing for sale. However there were two things to blame for such a statement: First insufficient advertising on the part of those who are manufacturers or jobbers of such products, and, second lack of interest in the readers of such advertisements which appear in the trade papers from time to time. Hence we feel that the reading of the advertisements is a vital "shop economic." The boss should not only read it but also see that both these, his employees read it. Thus deriving a benefit all round. When some topic has been taken up in the paper, both become acquainted with it and may join in friendly discussion which to say the least is bound to be beneficial to one of the parties. Then such talks are often the means of bringing out such sympathies which have previously been hidden away in one's heart.

Some time ago the writer was standing at the shop door of a sanitary engineer and saw a lot of short pieces of pipe unloaded, scarcely a thread on them.

Now what did such a state of affairs mean to the boss? Just this. In the first place when the pipe had been taken to the job, there was as we all know would be, two threads on each length of pipe. Who had got these threads let us ask. Why the customer of course. Yes and who paid for them? Not the customer by any means. What should be done is, after a piece of pipe has been cut a new thread should be put on the remaining piece, either to be ready for use, or, to return to the shop, thus giving the boss as many threads back as he supplied in the first instance.

Another small leak could easily be taken care of by a little forethought on the part of the boss or journeyman, viz., when going to a new job of any size, take a box with several partitions in it and have the various fittings placed in the box and kept there until used, thus doing away with the loose method of having fittings thrown all about the floor, allowing grit and dirt to get into the threads,

as well as eliminating the loss of a large number of fittings.

In these days of keen competition it behooves every one engaged in the trade to study the conservation of fittings, pipes, etc., and other items, which are in general looked upon as matters of small amount. The time when a plan is drawn of each job and the fittings marked on the plan, will be hailed with joy by the employer.



THE DOMESTIC, SANITARY AND HEATING ENGINEERS OF ONTARIO.

Dear Sirs:—

Are you aware that in about three months, we, the members of the Ontario Society, will be in convention again, trying to better our condition. If so, what are we going to bring before it to help to better our conditions. You have had some difficulty with the manufacturers, jobbers and wholesalers; also your fellow competitor. Are you thinking out some scheme to help your directors to fathom this difficulty. If so, send it to the general secretary in February, so that we can compare it with others we have. There is another question which you should ask yourselves. What are you doing to increase our membership? As you are aware we are not overburdened with money to organize; so why not you do a little and help along this great cause. It would not cost you anything and be to your advantage, as the more bright and intelligent men following our craft we have with us, the better for everybody. Wishing you a happy new year.

Yours very truly,

F. R. Maxwell,

Member of Executive Committee.



AN IMPORTANT AND WORTHY RESOLUTION WITH EDITORIAL COMMENTS.

Plumbers Demand Laws to Enforce Sanitation.

The Commission of Conservation has received the following interesting and important resolution from "The Trades and Labor Congress of Canada":

Whereas, the heavy increasing death rate and infant mortality, particularly in some of our large cities, is due in a

large measure to the unsanitary systems of heating, ventilation and sanitation, thereby causing a serious condition of life, and

Whereas, the present laws recognized by some of our Provincial and Municipal bodies are in many instances contrary to the laws of sanitation, lacking effectiveness and uniformity, and thereby endangering the lives of the people, and

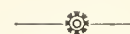
Whereas, the question of health of the community should be the first consideration of all our governing bodies, and as all important scientific and medical bodies declare the urgent necessity of the highest standard of sanitation for the conservation of human life and the adoption of modern systems by all cities and towns,

Be it resolved, that this Congress endorse the action of the United Association of Plumbers and Steamfitters in its efforts to establish Dominion and Provincial laws governing the installation of modern sanitary systems of plumbing and heating, and that the officers of this Congress along with the officers of the United Association endeavor to place this important matter before the Dominion Conservation Commission with a view to their recognizing the necessity of Dominion legislation in sanitation instead of the present unsatisfactory Provincial and Municipal laws governing this matter at present.

Several years ago the writer took up this same position, with regard to our Canadian laws on sanitary matters.

He voiced his ideas in no small way, but, those with whom he took the subject up, seemed to feel he was opening up more of a utopian idea.

A few weeks ago Sanitary Engineer published an article entitled, "Federal Department of Health," which would in the main if thoroughly discussed in an earnest and sympathetic manner give the public at large, far greater protection in matters of sanitation, which involves of course, the disposal of sewage, water supplies, garbage collection, heating and ventilation.



NEW VENTURE.

Rossland, B. C.—George Trickett is reported as having opened an establishment and will carry on business in the sanitary, heating and ventilating line. We wish him success in his venture.

Atmospheric Pressure and Its Relation to Sanitary Engineers

Showing in a Simple Way That Sanitary Engineers Could do Their Work Much More Satisfactorily Providing They Took Time to Study More the Laws of Gravitation, Syphonic Action and Atmospheric Pressure.

By Professor Arthur Bateman
Director, Anglo-American Sanitary Correspondence College, Chicago.

We have shown some examples which go to prove the value of the weight of air above us, yet it possesses disadvantages which necessitates considerable expenditure on our work. The writer refers to the breaking of the water seal in traps by siphonage. Now unless an air pipe is taken off nearly all traps at a distance varying from 3 inches to 16 inches from the crown, siphonage will doubtless occur, breaking the seals, and allowing the foul gases for ever present in waste and soil pipes, to find their way into the interior of our buildings.

Siphonage will occur if a quantity of water is suddenly discharged through an unventilated trap, driving the air before it and producing a partial vacuum, which is bound to result in siphonage. Again if an appliance is used on one of the upper floors, and the main stack and traps are unventilated, the falling water, resembling a solid piston or plunger passing down the stack will draw air from the branches, reduce the pressure in the inside, and the superior weight on the surface of the water in the trap will force the contents out.

Finally, permit me to mention the collapsing of hot water boilers. Collapsing of boilers is invariably due to the supply becoming frozen, and the fire under the heater kept going, which generates vapor and steam in the boiler. When the fire dies out the steam and vapor condenses back into water, and a partial vacuum is formed. When this reduction of internal pressure takes place, the external atmospheric pressure of 15 pounds on the square inch is so great that the sides of the boiler are crushed in, or in other words the boiler collapses.

The typical examples offered in the last issue of "The Sanitary Engineer" undoubtedly prove the value of the weight of the air above us, yet it possesses disadvantages which necessitates considerable expenditure on our work.

Let us consider for a moment the breaking of the water seal in traps by siphonage.

Siphonage will occur if a large quantity of water is suddenly discharged through an unventilated trap. The sewage in passing through the soil or waste

pipe drives the air before it and creates a partial vacuum in between the outflowing sewage and the water seal of the trap. Thus we have 15 pounds atmospheric pressure on the surface of the trap and nothing to counterbalance it on the outlet side. Hence the water is driven out by what is technically called siphonage.



Prof. Arthur Bateman

Again, if an appliance is used on one of the upper floors and the traps are unventilated, the outflowing sewage, resembling a solid piston or plunger, passing down the stack is bound to draw air from the branches, reduce the pressure in the inside, then the superior weight or pressure on the surface of the water in the trap will drive out the contents.

To obviate the breaking of seals by siphonage, it is imperative to instal a system of piping known as vents or re-vents, as the case may be. The object of these pipes is to supply a column of air under all conditions on the outlet side of the trap, and if of adequate size and correctly connected render siphonage impossible.

In many localities these pipes are taken directly off the bend on the outlet of the trap known as crown venting, but in progressive towns this method is prohibited, due to the fact that it is attended with grave likelihood of vent stoppage.

In every case the vent should be placed at least 3 inches from the crown of the trap, otherwise the sewage being

constantly ejected into it, will in time stop it up and render it useless for the purpose it was intended.

However, it should not be located at a greater distance than 20 inches from the trap, as it is possible for a vacuum to be formed even in the short distance of 20 inches, and should this occur, siphonage will follow and allow the foul gases for ever present in soil and waste pipes to pass freely into the interior of the building.

Undoubtedly the most proficient method of venting is known as the continuous system. Of late, this method has found much favor in all parts of the country, and rightly so, for it certainly is the simplest, cheapest and most efficient.

It consists of a vertical waste and vent in one piece. The trap, which usually takes the form of a P or half S, is connected some two inches below the centre of the outlet of the fixture through a fitting similar to a TY, yet it forms part of the fitting itself. That portion below the trap is termed the waste, and that above the re-vent. Where this method is adopted, all the vertical lines, coupled with the horizontal wastes, can be conveniently run behind the partition with less labor and consequently cost than the aforementioned methods.

Even when an ideal system of venting is carried out, atmospheric pressure may yet break the seal of traps by oscillation.

Fortunately this only occurs in high buildings having long lines of vertical soil, waste and vent pipes, and during very stormy weather. At certain periods the wind blows directly down the terminal of the vent pipe above the roof and endeavors to drive out the water in the traps into the fixtures themselves. Almost immediately the wind may divert from its original course, and blow right across the top of the pipe, creating a partial vacuum in the soil and waste pipes.

This occurs so rapidly that part of the seals are likely to be carried over the outlet of the trap, and should this alternate compression and vacuum be continued the entire seal will be gradually

(Continued on page 26.)

Analysis of Canadian By-laws

In This Issue We Are Commenting on the By-laws in Vogue at Present in the City of Calgary, Known as By-law No. 1531, and Which Came Into Force on the 24th Day of February, 1913 — These Comments Will be Divided Into Several Series, of Which This is Part Two.

In our December 1st, 1913, issue we took up the first 16 clauses of the Sanitary By-laws in vogue in the City of Calgary and will now continue by taking up the next clause which deals with the fees levied for inspection of plumbing and reads as follows.—

CLAUSE 17.

With each application shall be deposited the following amounts to cover cost of inspection and entering of records:

For five (5) fixtures or under, the sum of One Dollar and Fifty Cents (1.50) and for each additional fixture the sum of Thirty Cents (\$0.30).

This is a very commendable clause and no doubt gives fairly good results in Calgary. We have not heard anything to the reverse, and up to the present time it is the first of its kind which has come to our notice, though we are informed that several Canadian cities are revising their by-laws, hence we may reasonably come to the conclusion that some of the novel clauses which are embodied in several of those recently revised will be acted upon by other cities.

CLAUSE 18.

This is general and is in almost every by-law of this nature. It deals with the period of time required to file notices for inspection and allowing two clear days between the filing of notice and inspection. The last paragraph though we will reprint. Viz.:—

No work shall be considered ready for testing unless soil pipe is extended three feet outside of foundation wall, and properly supported with iron hangers and brick or concrete piers when necessary.

Even this is general, but we think this is rather incomplete, by the very fact that it does not mention where the soil pipe shall begin at which would require testing. Of course we may infer that what is meant is, that the soil pipe shall terminate at the roof and that the vertical stack will need to be filled with water (for the water test when weather permits). But even that would not be clear of criticism. For instance, if a building

is more than 50 feet in height and has a vertical stack more than that length we would advise more than one test, or shall we say that such a stack should be tested in sections of not more than 50 feet, and that in all cases the horizontal portion along with not more than 50 feet vertical should be tested in one section, viz., that fifty feet vertical soil pipe and all horizontal drains connected to a point not less than three feet outside of foundation wall be considered as ready for test.

CLAUSES 19 and 20.

Simply deal with the different weights of soil pipe will be allowed, viz., medium and extra heavy and that all pipe must have a coating of oil.

Clause 21 includes one or two things we can comment upon hence we will reproduce it in full.

CLAUSE 21.

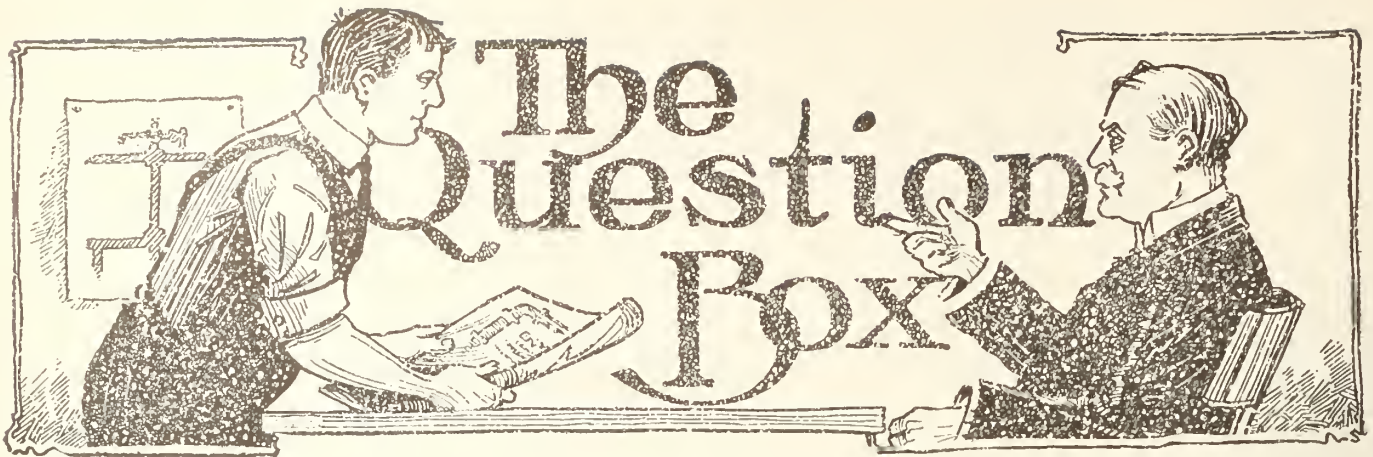
The size, weight and maker's name must be on every length of pipe and fittings. All joints must be made with pitched oakum and molten lead. Twelve (12) ounces of soft pig lead must be used at each joint for each inch in the diameter of the pipe.

The first sentence of this clause is good and every sanitary engineer should see that each length be subjected to inspection. He should also get the habit of specifying whose pipe he wants. For instance, the writer saw some soil pipe not very long ago in a fairly large city, which had no identification mark on at all. It was a poor looking sample of soil pipe. Of course it must be said, there was a long parallel mark on which was supposed to be a name, but we could swear that no one could tell whose name it could be. Then comes the question of joints and their making; now this clause strictly states that molten lead be used. It should also state how many pourings should be made. The writer has always felt that too little importance is placed on this subject. It is a well known fact and one which has been tried out time and again that a joint such as we are discussing should be poured at twice. The first pouring ought to be about 20 ounces and should be caulked well. Then the second pouring should be 28 ounces and again well caulked, such a method

would ensure a tighter and better made joint. For instance, when the first portion is poured then caulked, we have first portion expanded close to the walls of the pipe to the extent of about 3-16 of an inch. The second is then poured and has a more solid foundation to be caulked upon. It will not only have a greater surface caulked to a greater depth of joint, but will likely be caulked on the lower portion of the pouring. This method has been tried out and it has been found that by so doing even the caulking strain need not be so great. Another feature in favor of two pourings is this. The first pouring will only nicely warm the hub and no fear of cracking if the metal is a little too hot, whereas if the metal happens to be a little too hot or the weather is extremely cold thus causing the soil pipe to be extremely cold, the pouring of the full 48 oz. (speaking of 4 in. soil pipe joints) such a quantity is apt to cause the hub to crack. How many of our readers have had a cracked hub after the whole job has been roughed in, and have taken every precaution to tap or shall we say sound the pipe or fitting before installing it, then when the test has been put on, have found a cracked hub. This pouring the whole joint at once and other conditions aforementioned has been the reason for many a cracked hub.

Then further, this clause calls for (molten pig lead). It does not state that where dampness prevails, water in a trench, or where an inverted joint has to be made say in a back vent, that lead wool would be permitted. Now under certain conditions it is dangerous to use molten lead and seeing that the trade has such a good substitute in all fairness to both manufacturers and craftsmen this should be mentioned in this clause. While we aim at the very highest efficiency which these days of progress has brought us to, while we certainly wish our by-laws on sanitary engineering to be as clear and rigid as possible, we at the same time should aim at their being as elastic as good theory and practical experience will allow, without endangering the actual efficiency of the work and as one who has used lead wool knows whereof he speaks.

(Continued in our next issue.)



Subscribers Are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks Are Also Invited.

HOW TO CONNECT WATER FRONT TO RANGE BOILER IN CELLAR.

Editor, Sanitary Engineer.

Would you please show me in your next edition of Sanitary Engineer, which is the best way to connect up a water front boiler, the boiler being in the cellar and the range in the kitchen above, so as to heat water for bathroom on second floor.

Also what connections are the best to take off water boiler if it is suspended from the cellar ceiling horizontally.

Yours truly,

P. F.

Replying to this question by P. F., we may say, this is a very unusual connection and one which if possible should not be made. Of course it is possible to get fairly good results if the following rules are strictly followed. See Fig. 1.

The distance from the bottom pipe where it enters the water front to the pipe entering the lower portion of the boiler should be exactly one-third the length of the top pipe in height, for instance if the distance from the bottom of the boiler to the lower inlet at the water front happens to be 8 feet, it would be necessary to carry the top pipe up to a height of 24 feet as per sketch. However, if the boiler is suspended the distance would not be so great, but the same rule would apply.

If our readers will look at Fig. 5, we have shown how this should be done, finally let us state that all pipes should be reamed and no horizontal pipes should be very long or trapped.—Editor.



SHOULD THIS TRAP BE VENTED?

Editor Sanitary Engineer:

Re the enclosed sketch, would you please tell me if it is possible to syphon this sink trap and if not, why are we called upon to vent them.

Yours truly, P. F.

We have herewith reproduced the

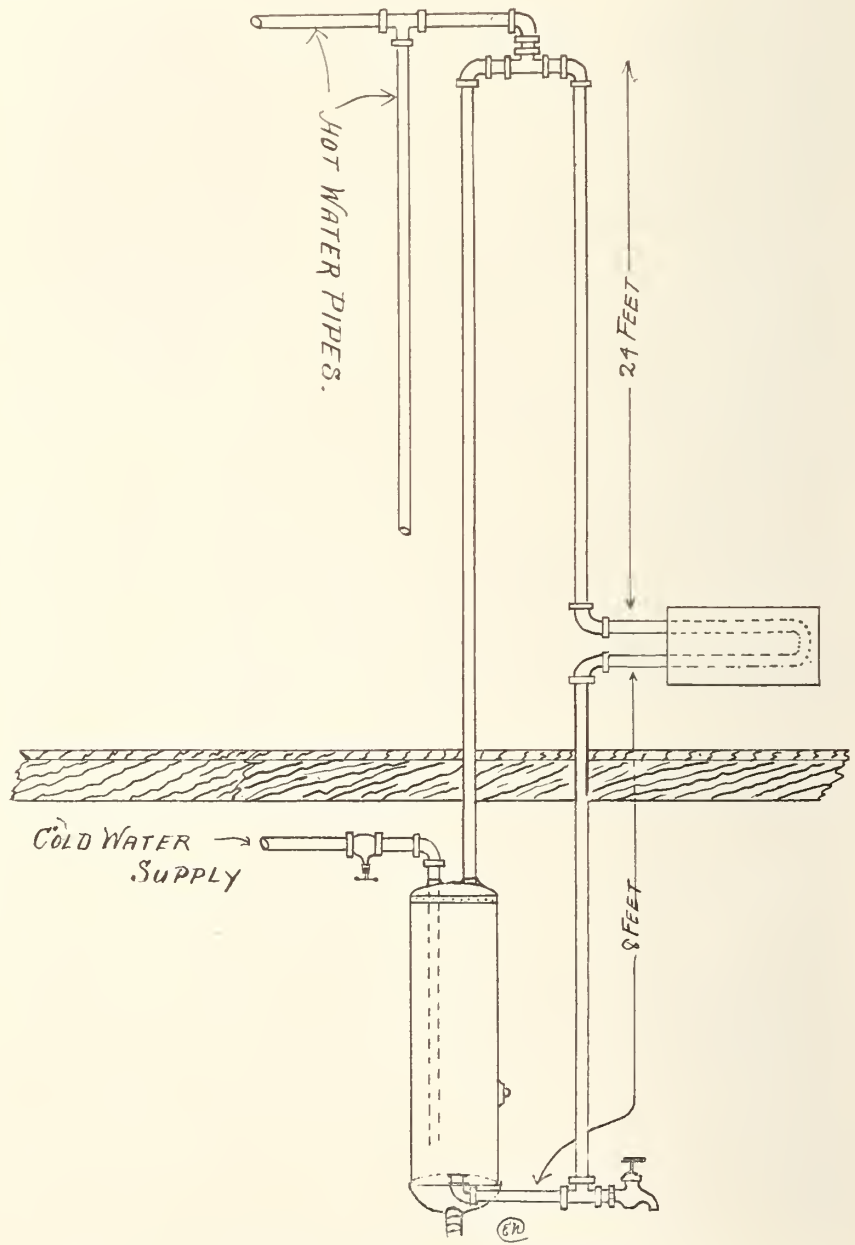


Fig. 1.

sketch sent in by P. F., and may state that this trap should be vented, because if he will watch the drawing he will see that when the W.C. is flushed, the water on its downward course will fill the whole bore of the 4 in. pipe at about the position of the fitting, where the waste from the sink enters the slack. This water forms a piston and as it passes the sink waste branch it is bound to draw the seal. Though it may not act in that way every time, the chances are it may. If

them being of interest to mostly all our readers.

We have reproduced his sketch and will explain. There are several reasons, the most important being this:

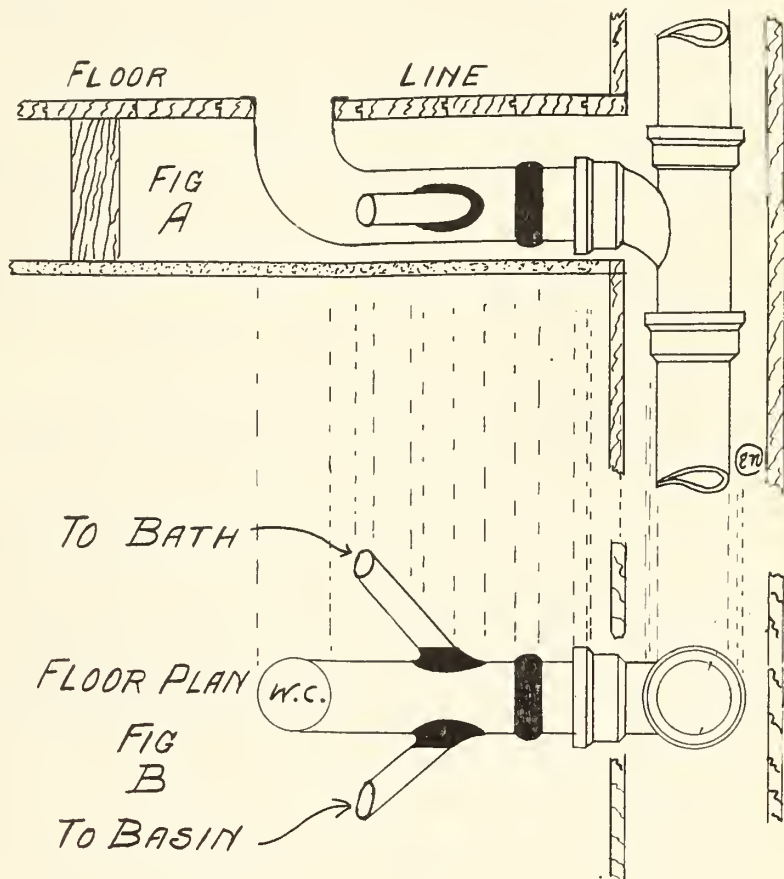
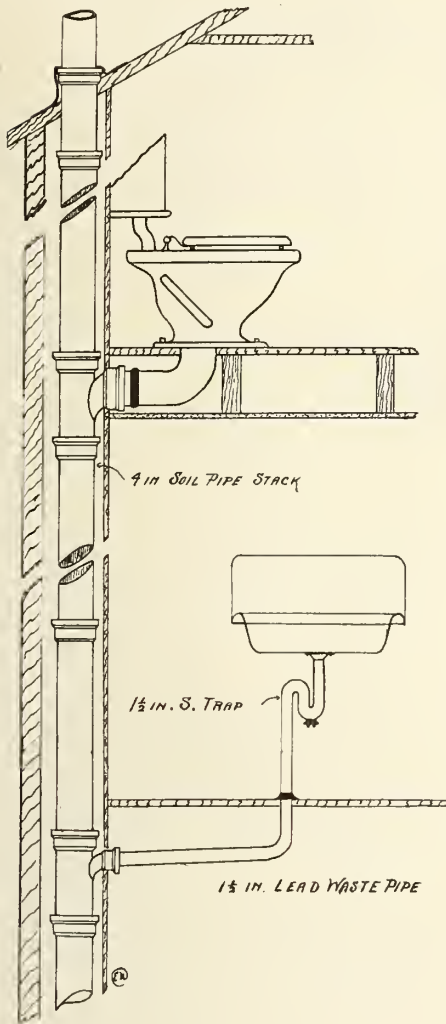
When the W.C. is flushed the lead bend is full of water for a short period and on this water passing the branch it is bound to form a suction on the said branch and syphonic action takes place. Of course if the trap is vented the objection is not so great. But we are sure each fixture should have its own outlet to the stack.

There are very few cities in Canada to-day where branching into the lead

a number of years until a few months ago, and when reading your article entitled "Plans of Work Recently Installed in a Canadian Public School," I thought I would like you to give me a little more information for my own satisfaction.

I must say I am well pleased to see the stand you are taking in Sanitary Engineering, for it is about time some one should wake up and insist on competent men being appointed to inspect plumbing. They should at least demand that men of long experience only fill such positions.

In Fig. 2 would you kindly explain if



P. F. will get a cork and push a stick through the cork, then take grate out of sink, then drop the stick and cork into the entrance of trap, flush the W.C. above and watch what happens, he will be convinced that a vent is necessary.—Editor.

bend is tolerated, and where they are allowed there is a move on to discontinue such a practice.—Editor.



A LETTER FROM BRITISH COLUMBIA.

Editor Sanitary Engineer.—In your December 1st issue I note an article regarding plumbing and plumbing inspectors, and wish to say this is the first time I ever knew that plumbing inspectors were given such a position, and were not capable of passing a stiff examination, which I always believed a plumbing inspector had to pass. I have been in the plumbing business for quite

it would be correct to have used a N.P. 1 1/4 S. trap, non-vent, in the place of all the fittings and P. trap. I know that Fig. 3 is correct. But why do companies sell non-vented S. traps if they are not correct? Will an S. trap syphon if vented at the floor as near as possible to the flange connection similar to Fig. 2? Also in Fig. 1 does each closet need a back vent of 2 inches in diameter, or would a 4-inch stack taken from the last w.c. be correct? I have been told that closets need not be vented unless more than 4 feet from the main soil pipe.

Yours truly,

Grand Forks, B.C.

G. W. C.

Replying to G. W. C., we can assure
(Continued on page 26.)

WHAT IS WRONG HERE?

Editor Sanitary Engineer:

Please inform me in your next issue what are the objections to a person wiping the waste pipe from the lavatory and bath into the lead bend providing it is wiped away from the heel of the lead bend as per sketch. P. F.

P. F. has sent us several questions which we are going to answer because of

Heating and Ventilating Problems

A Series of Articles Will Appear in Sanitary Engineer Dealing With the Above Problems—This Article Will Deal With a Ventilating Problem Which Gave Splendid Satisfaction, Though Very Simple, by the Use of What is Known as an Emerson Ventilator.

No. 1.

It is well known throughout the civilized world that the matter of proper ventilation in our homes, our office and factory buildings is one of the most vital problems of the age.

Our Food and Drugs Act protects to some extent the food we consume.

Our plumbing ordinances take care to a certain extent also of the method by which the domestic sewage is either conveyed away from our dwellings and other building, though the proper method for finally disposing of such matter is yet being investigated. We have, however tried several methods which have in a way answered our purpose.

Ventilation.

The problem of ventilation is one which, too, has recently become more interesting to the trade.

It is, however, still in its infancy. It is a problem which has been too long neglected, and it is surprising, yet nevertheless true, that we can exist longer and fare better with poor food than we can under conditions of poor ventilation.

Our health authorities do not demand in terms forceful enough that our homes be properly ventilated, and what is the result? Pale faces, tuberculosis and scores of other aches and pains which humanity seems to be heir to. Hence we should take this problem to heart and

However, in this article we will deal with a simple ventilating problem which came to the notice of the writer not very long ago—namely, that of a small hall.

The hall was not properly ventilated and the consequence was, the hall became overheated, particularly when a large number of people were present. If windows were opened in cold weather there was a draft, etc.

However, the writer was asked to solve the problem, which was done as follows:—A large cast iron register was placed in the ceiling, and to it a square to round galvanized box was fitted. Then a 24-inch pipe was placed in between the ceiling and the roof in the form shown in plan A, the chief item being what is known as an Emerson ventilator, improved style.

It may be here stated that the original Emerson ventilator had a flat disc for the hood, but experience has proved this improved type to give far better results. We will now explain more fully how this hall was successfully ventilated. First, by installing an Emerson ventilator, Fig. 1., in the way shown. The idea of the straight pieces being carried down was so as to form a receptacle to catch any condensation which might take place, as well as any rain or snow which might be apt to blow down

arm on one side of the bar, which caused the check to always stand open when the rope was loose, and when the controlling rope was hooked down the check was closed.

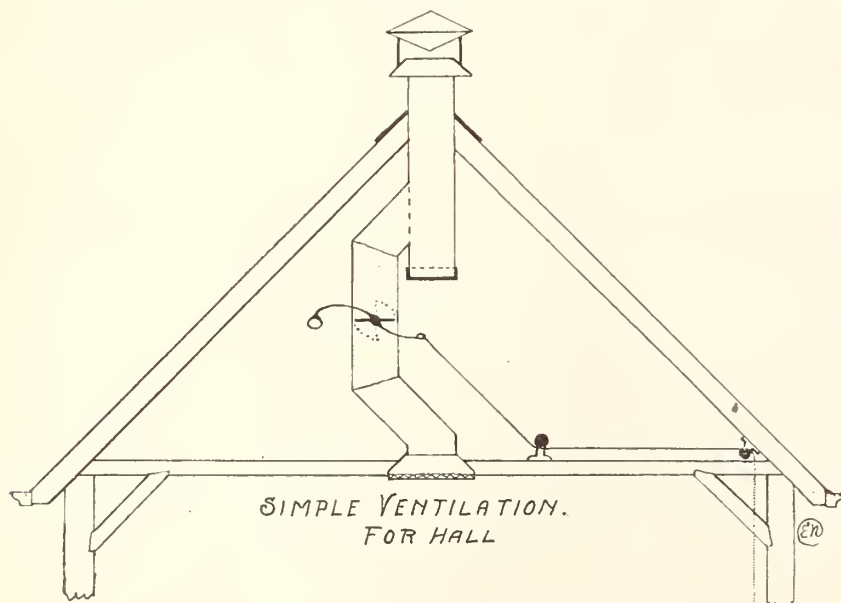


Note inlets of fresh air.

To admit air in at the windows a piece of $\frac{1}{2}$ inch lumber was fastened on the sill inside the window the full length of the sash, as shown in Fig. B. The bottom sash was raised and the piece of $\frac{1}{2}$ -inch lumber, which was hinged, also raised, cutting off any draft and fresh air was let into the room between the two sashes. This scheme worked well, and gave every satisfaction.

We will now go into the method of construction of this Emerson ventilator, shown in Fig. 1.

Fig. 2.—First, draw the dotted line A. B., which should represent the total height of the ventilator. We will presume we are developing a pattern for a 6 in. one. We will then take the compasses and mark off the diameter 6 inches from B. Then draw a horizontal line, as shown at G. G. This line should be exactly twice the length of the diameter to be in proper practical proportions. Then place the compasses where A. B. and G. G. intersect at 4. Then open up to G. and mark off on dotted



study more the methods of ventilating. In some future issue we will show how closely related the two problems—viz., heating and ventilating are.

the ventilating pipe, had it been put straight down.

A check was put in similar to an ordinary stove pipe damper, but with an

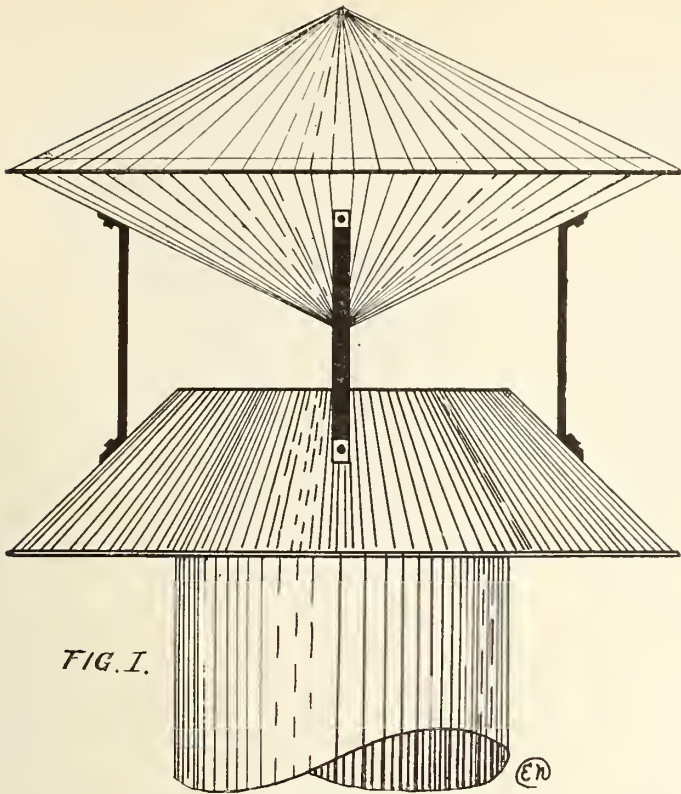


FIG. 1.

Fig. 1.

line at H. Then draw line 5, which should be exactly 45 degrees with A. B., and should also meet lines 1, which rise in dotted form. This is the actual opening of ventilator. We must now develop pattern E, which is bottom of flare D. This is done by placing compasses at centre 4, and opening up to point G, which reaches point B. Then close compasses and inside diameter of bottom. Then space off as shown and mark 1, 2, 3, 4, 5, 6, 7, all to be of equal distance apart.

We will now proceed to develop pattern for flare D, as shown in Fig. 3. Draw vertical line, and make centre H. Stretch compasses from H to G on Fig. 2, and make a circle as shown. Take the stretch-out measurements, 1, 2, 3, 4, 5, 6, 7, shown on Fig. 2, and start at 1 in centre at top of circle, spacing off as shown twice on the right and twice on the left. This will give the exact outside diameter of flare.

Then to mark out centre place compasses again at H on Fig. 2, and open up

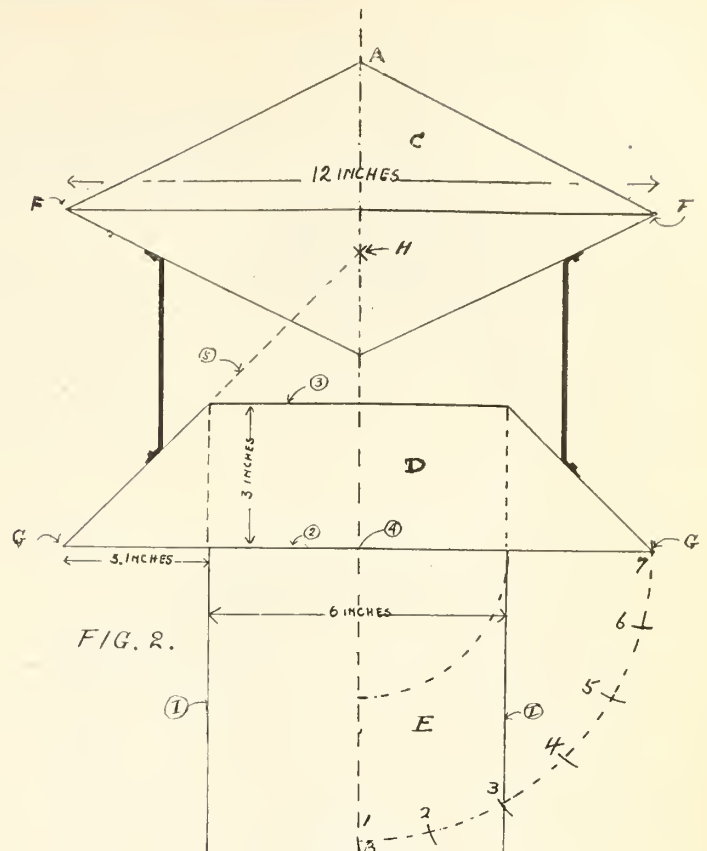


FIG. 2.

Fig. 2.

to where line 5 meets line 1 at G and H. Then transfer this diameter, as shown in Fig. 3. Place the straight edge at H and G, Fig. 3, and develop line 1. Then mark off sufficient allowance for seam, which should be made as shown in Fig. 4.

We will now develop the top and bottom of cone C, which are both exactly alike, except the piece to be used for top half must be a little large to allow for seam as shown.

(Continued on page 58.)

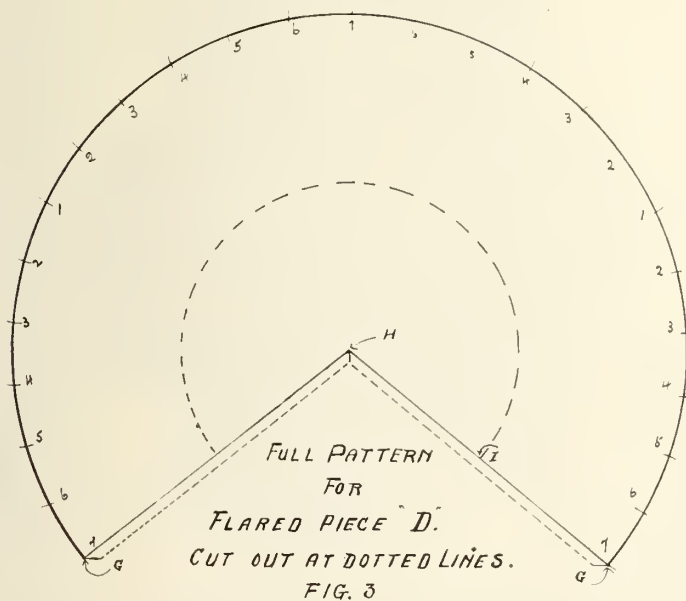


Fig. 3.

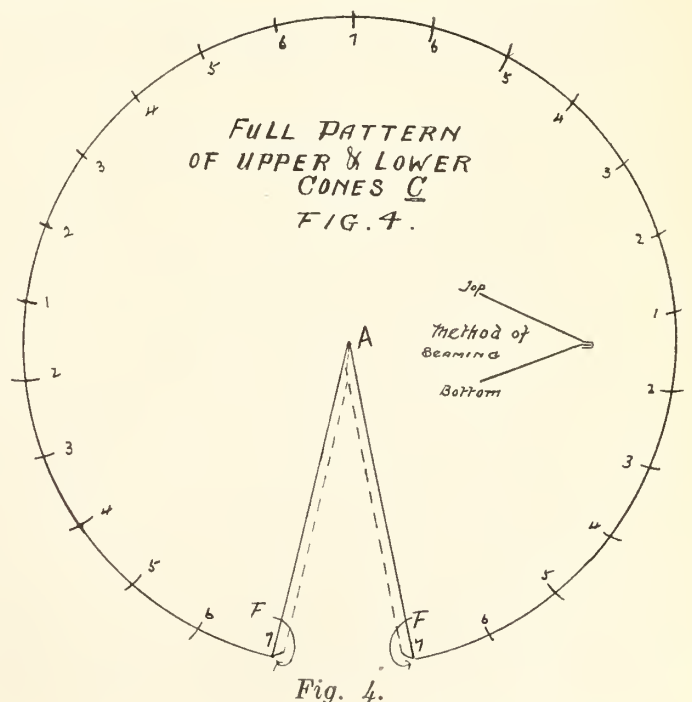


Fig. 4.

LETTER FROM BRITISH COLUMBIA

(Continued from page 23.)

him that such is the case re such an appointment, and further we may say the incident happened in British Columbia, in the City of Nainamo. If he writes to the Free Press he will have his eyes opened to the real state of affairs. We sympathize with the public of that city in no small way, and would not have named the place except that the Press have given the matter such publicity.

We thank our reader for his complimentary remarks, and may state that Sanitary Engineer will always devote its pages to the betterment of the craft, in both technical and as an incentive to give the public a square honest deal.

Dealing with his inquiries. First—No, the use of a N.P. non-vented S. trap

In answer to his question will an S trap syphon if vented at the floor near to the floor flange, we certainly believe it will, and we can assure him from past experience that where a vent is neces-

proper way to vent an S trap is shown in Fig. 4.

Space does not permit to deal with his question re the venting of w.e., but we will deal with it in our next issue.—Editor.



ATMOSPHERIC PRESSURE.

(Continued from page 20.)

carried into the soil or waste pipe and lost.

Still another disadvantage to this truly wonderful atmospheric pressure is the collapsing of hot water boilers.

Collapsing of boilers is invariably due to the supply becoming frozen, and the fire under the heater kept going. When the fire dies out the steam and vapor previously generated condense back into water, thus leaving a partial vacuum in the interior of the boiler.

Now just as soon as this reduction of internal pressure takes place the external pressure of 15 pounds per square inch is so great that the sides of the boiler are crushed in, or, in other words, the boiler collapses.

To obviate this, a vacuum valve should be fixed on the boiler, admitting air in the event of any internal reduction of pressure.

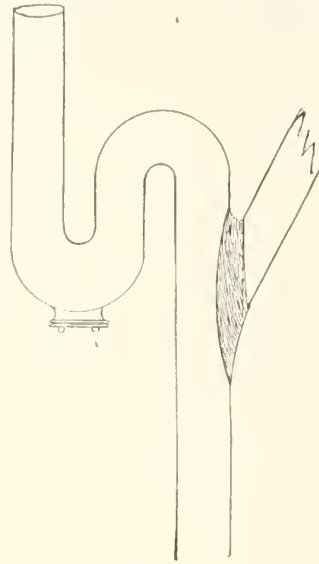


Fig. 4.

sary it is always needed as near as possible to the crown of the trap, though we do not favor crown venting. The

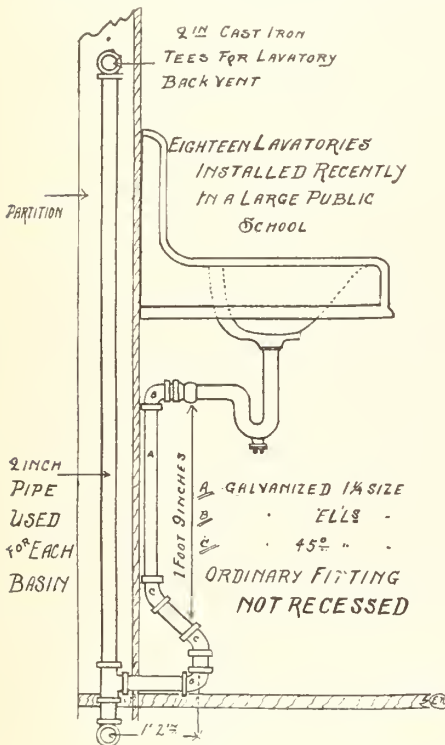


Fig. 2.

would not be correct under the same conditions. Now just look at Fig. 2 and note the distance from the crown of the trap, or, say, an ordinary P. trap, and imagine the length of column of water which is formed on its downward course. The moment the water in the basin was lowered to the waste outlet, there would be sufficient water in the vertical leg to syphon the rest of the water out of the trap, because there is more water in that portion, which, as it were, forms a piston, and is bound to syphon it, and especially when the water has several feet to travel in a horizontal course.

As to G. W. C.'s question why do manufacturers make these traps, we would state that in many cases these are used and vented by the plumbers. There will always be a supply where there's demand.

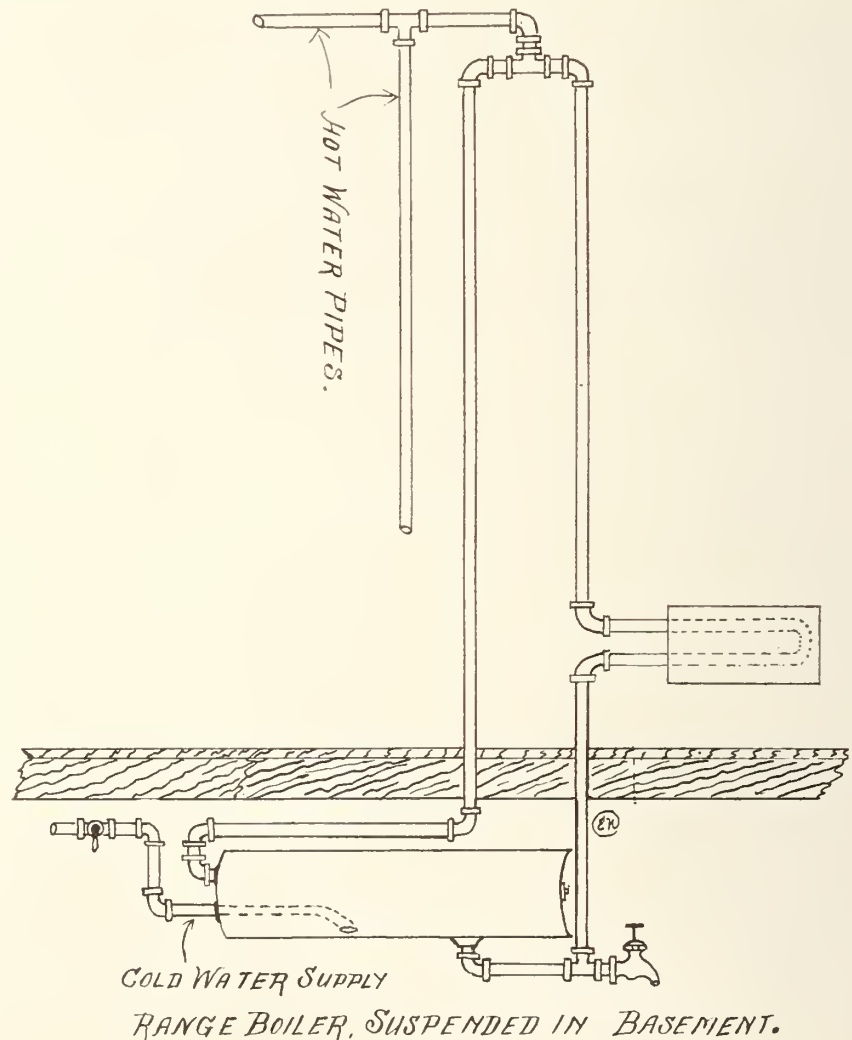


Fig. 5.



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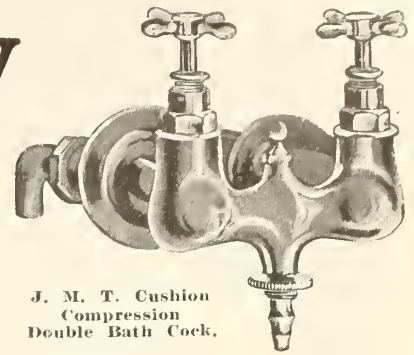
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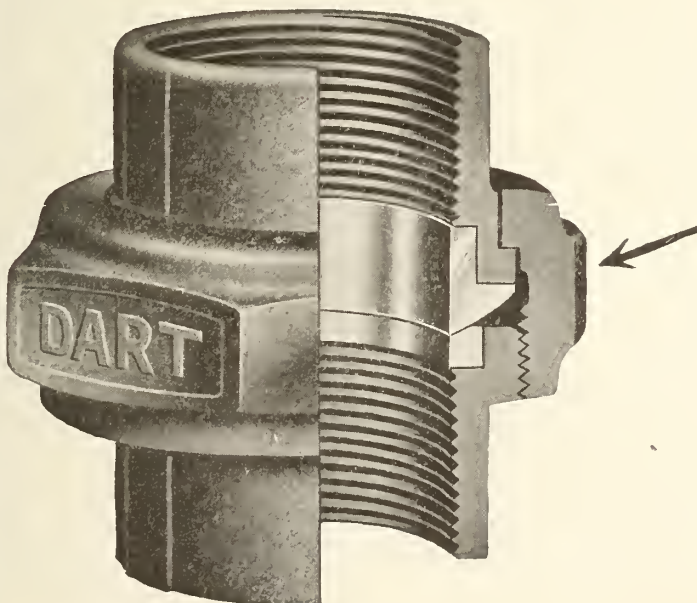


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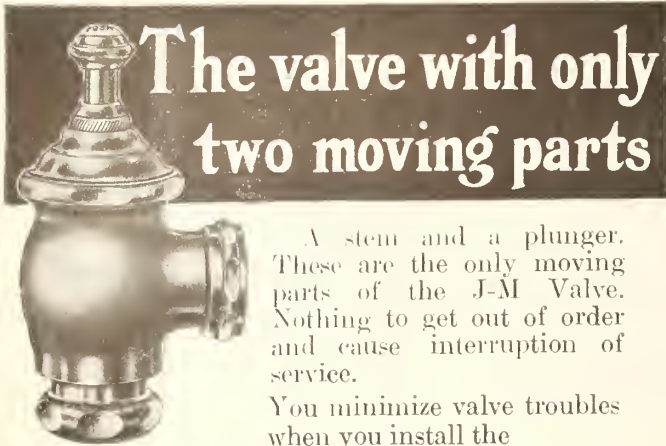


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Iron Pipe Size.

Brass and Copper Tubing.

Brass and Copper Rod.

Brass and Copper Sheet.

Tallman Brass & Metal Co.
HAMILTON, ONT.

ALPHABETICAL LIST OF ADVERTISERS

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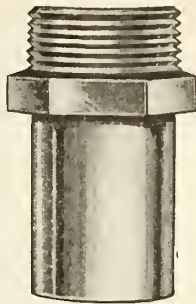
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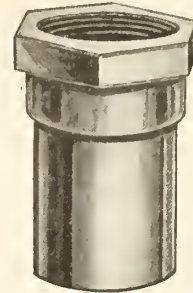
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Watson & Paul 30

SEND US
A SAMPLE
ORDER



We Manufacture "Imperial" Soldering Nipples of Quality

One trial will convince you
that we make the best nipples
you ever saw



WE MAKE
THE BEST
ONLY

THE CANADA METAL CO., LIMITED

FRASER AVENUE TORONTO

50 BRENNAN STREET MONTREAL

301 CHAMBERS STREET WINNIPEG

Economy Automatic Condensation Pump and Receiver

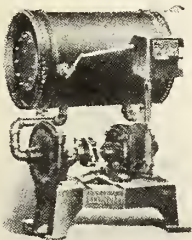


Fig. 2129.

An expansion tank, an automatic switch and a centrifugal pump automatically operated by an electric motor.

STIMULATES CIRCULATION by drawing condensation through system, venting the air and returning the water to the boiler at high temperature.

ELIMINATES SNAPPING AND CRACKING in the radiators and pipes. A **STIMULANT AND GOVERNOR** to the entire system.

A great **SAVER OF FUEL**. Requires no attention other than an occasional oiling.

Operates equally well on high or low pressure systems.

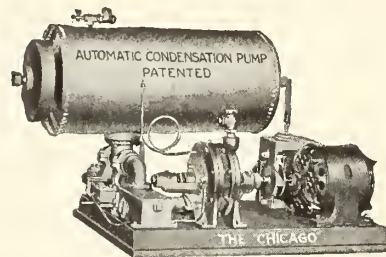
Tell us your troubles and we will advise you how to overcome them.

Thomas & Smith, Inc. 116-118 North Carpenter Street, CHICAGO, ILL.

Canadian Distributors: FRANCIS HANKIN & COMPANY, 117 Mail and Empire Building, Toronto, Ont.; 201 Corstine Building, Montreal, Que. J. A. McTAGGART & COMPANY, Travellers Bldg., Winnipeg, Man.

How to Place Radiation Below Water Level in Boiler

Save Digging a Boiler Pit and 20-50% Coal



Write for Catalog D, giving the above information and describing the

"CHICAGO"

Condensation Pump and Tilting Tank Receiver.

CHICAGO PUMP COMPANY

915 W. Lake Street, CHICAGO, ILLINOIS

ADS AND SALES

By HERBERT N. CASSON

A Study of Advertising and Selling from the
Standpoint of the New Principles
of Scientific Management

Something in it for Every Advertiser, Advertising Manager,
Corporation, Salesman, Sales Manager, American
Business Man.

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- II. Efficient Salesmanship
- III. A Sales Campaign—How to Start It
- IV. Face to Face Salesmanship
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- VI. The Weak Side of Advertising

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- VII. The Principles of Efficiency Applied to Advertising
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PRICE, \$2.00 NET

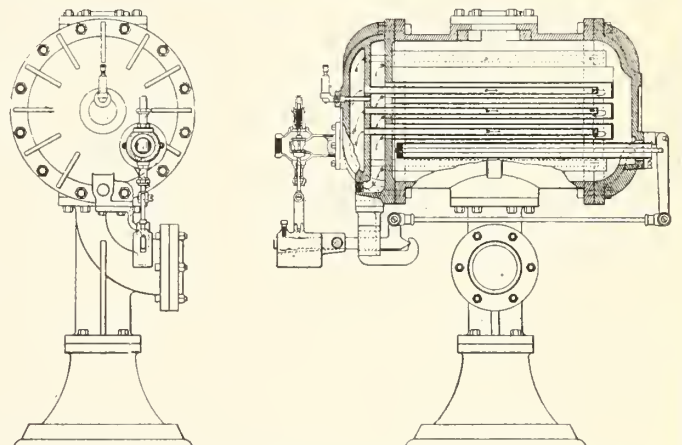
Postage, 13 cents additional

TECHNICAL BOOK DEPARTMENT

MacLean Publishing Co.,
143-149 University Avenue, Toronto

The "Manny" Heater

Affords Every Aggressive Steamfitter An
Excellent Opportunity to Make Large Profits



The Manny Heater is connected to a hot water system as the ordinary hot water furnace, and steam is carried to it from a boiler house stationed outside the main building, at regular boiler pressure, but reduced at every heater by a steam pressure reducing valve to 20-15-10-5 lbs., or as low as one pound to the square inch, according to temperature required in the building. The steam is carried to the Manny Heater from the boiler room through underground pipes.

There isn't a better or more economical way of heating large buildings. Many furnaces can be eliminated and much space saved. Supplied with or without Thermostats. Notice how provision is made for the expansion and contraction of tubes—Threaded Joints.

Let us give you full particulars, regarding this newest and best method of heating. Write for descriptive catalog F.

The E. S. Manny Co., Montreal

Condensed or "Want" Ads.**FOR SALE**

WILL SELL THE EXCLUSIVE RIGHTS OF handling the B-H Vapor Vacuum Specialities in Canada to reliable party. Address B-H Vapor Vacuum Heating Co., Emporia, Kansas.

READERS

The Editor wishes every one interested in

Domestic Sanitary Heating and Ventilating Engineering

to make use of this paper. Any article or problem of interest, any topic of note will be used if any such has a tendency to uplift the Trade.

Every local or provincial association can use this paper free of charge to make other members acquainted with the business done and benefits derived from being an organized body.

When writing advertisers kindly mention having seen the advertisement in this paper

STUDY**These Uncrowded Professions**

Sanitary Science and Engineering, Sanitary Inspectorship, The Science of Plumbing, Hygiene, under the directorship of Prof. Arthur Bateman, M. Inst. S.E., A. R. San. I., M. I. P., R. P. C., Eng

SUCCESS GUARANTEED.

Write for free booklet.

Desk 3

Anglo-American Sanitary Correspondence College, 10-12 W. Ontario St., Chicago, Ill.

One of the most successful retailers of late years says: "When a firm advertises in trade papers it is getting into good company. As I pick up one of a dozen of these periodicals here in my office, and glance through it, I find that the best people, the successful firms, are represented in such a way as to reflect their importance in the trade."

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FOR

SEPTIC TANKS

WATSON AND PAUL

93 St. Genevieve Street, Montreal



GENUINE ARMSTRONG STOCKS and DIES

FOR THREADING PIPE OR BOLTS

KNOWN, USED,
COMMENDED EVERYWHERE

PIPE MACHINES,
both Hand or Power
HINGED PIPE VISES
PIPE CUTTERS
PIPE WRENCHES
RATCHET ATTACHMENTS

**BARD ADJUSTABLE
BUSHINGS**

Manufactured by

**THE ARMSTRONG M'F'G.
CO.**

317 Knowlton St.
BRIDGEPORT, CONN., U.S.A.
NEW YORK CHICAGO

WRITE FOR CATALOG

Only One

kind is necessary for your various jobs—fittings or pipe. You can save the cost and the carrying about of more than one tool.



Williams' "AGRIPPA" Chain Wrenches are recommended unconditionally.

Williams' "AGRIPPA" Chain Wrenches do not depend upon only one point of contact for a bite—long life of wear assured.

Williams' "AGRIPPA" Chain Wrenches never place any compounded strain upon the chain—continuous operation assured.

Williams' "AGRIPPA" Chain Wrenches bear every mechanical feature necessary to complete utility and service—operating efficiency guaranteed.

YOUR DEALER WILL SERVE YOU.

J.H. Williams & Co.

Superior Drop-forged Tools

77 Richards St., Brooklyn, N.Y. City
40 So. Clinton St., Chicago, Ill.

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Air Line Systems.
C. A. Dunham & Co., Ltd., Toronto.

Aluminum Casting.
Tallman Brass & Metal Co., Hamilton.

Canada Metal Co., Toronto.

Brass Castings.
Tallman Brass & Metal Co., Hamilton.

James Morrison Brass Mfg. Co., Toronto.

Brass Goods, Valves, Etc.
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Steel & Radiation, Toronto.

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Standard Heating & Radiator Co., Pittsburgh, Pa.

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Anglo-American Sanitary School.

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National Equipment Co., Toronto.

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Empire Brass Mfg. Co., London.

James Morrison Brass Mfg. Co., Toronto.

Galt Brass Co., Galt.

Amherst Foundry Co., Amherst, N.S.

Johns-Manville Co., Toronto.

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Fittings, Limited, Oshawa.

Warden, King, Ltd., Montreal.

Steel & Radiation, Ltd., Toronto.

Empire Brass Mfg. Co., Ltd., London.

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James Morrison Brass Mfg. Co., Toronto.

Kerr Engine Co., Walkerville.

Tallman Brass & Metal Co., Hamilton.

Ejectors for Sewage.
Chicago Pump Co., Chicago.

Thomas & Smith, Chicago.

National Equipment Co., Toronto.

Fittings.
Fittings, Limited, Oshawa.

Steel & Radiation, Ltd., Toronto.

Warden, King, Ltd., Montreal.

James Morrison Brass Mfg. Co., Toronto.

Empire Brass Mfg. Co., London.

National Steam Specialty Co., Chicago.

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Honeywell Heating Specialty Co., Montreal.

James Morrison Brass Mfg. Co., Toronto.

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Steel & Radiation, Ltd., Toronto.

Warden, King, Ltd., Montreal.

Standard Heating & Radiator Co., Pittsburgh, Pa.

Pease Foundry Co., Ltd., Toronto.

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Tallman Brass Mfg. Co., Hamilton.

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James Morrison Brass Mfg. Co., Toronto.

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Hall & Sons, Ltd., Brantford.

Nipples.
Canadian Tube & Iron Co., Ltd., Montreal.

Warden, King, Ltd., Montreal.

Steel & Radiation, Ltd., Toronto.

Canada Metal Co., Ltd., Toronto.

Galt Brass Co., Galt.

Canadian Brass Co., Galt.

Empire Brass Mfg. Co., Ltd., London.

Wallaceburg Brass Mfg. Co., Wallaceburg.

Canadian Wolverine Co., Ltd., Chatham.

James Morrison Brass Mfg. Co., Toronto.

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Canadian Johns-Manville Co., Ltd., Toronto.

Pipe, Black and Galvanized.
Canadian Tube & Iron Co., Ltd., Montreal.

Steel & Radiation, Ltd., Toronto.

Warden, King, Ltd., Montreal.

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Leader Iron Works, Chicago.

Chicago Pump Co., Chicago.

C. A. Dunham & Co., Ltd., Toronto.

National Equipment Co., Toronto.

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C. A. Dunham & Co., Ltd., Toronto.

Steam Specialties.
Dunham, C. A., Co., Toronto.

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Williams, J. H., & Co., Brooklyn, N.Y.

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Dart Union Co., Ltd., Toronto.

Vacuum Systems of Heating.
C. A. Dunham & Co., Ltd., Toronto.

Nothing Like It as a Compression Stop and Waste—It's a Winner

Progressive plumbers everywhere are using MUELLER COMPRESSION S. & W. COCKS, the best thing of the kind ever offered the plumbing trade.

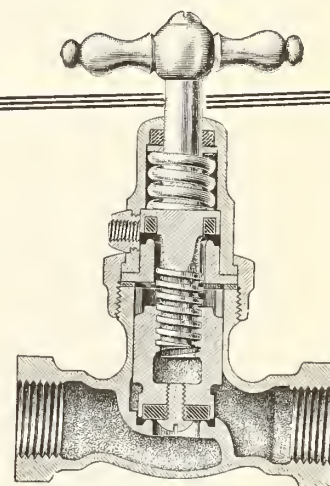
Order some of these cocks for your next job, you'll be pleased with them—so will your customer.

Mueller Stop and Waste Cocks are mechanically perfect. They can't waste until entirely shut off. No pressure passes through the waste hole. Every part is interchangeable—a big, strong point if you should ever need a repair. You're not apt to need it, however — these cocks are built to wear.

They are tested under 200 pounds hydraulic pressure and unconditionally guaranteed.

H. MUELLER MFG. CO., Ltd.

Sarnia, Ontario, Canada



D-8677

S.E.

**H. Mueller
Mfg. Co. Ltd.
Sarnia, Ont.**

Give me further
information and
prices on Mueller
Compression S. & W.

Signed.....

City..... Prov.....

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

Dead-beat and there's two hours to go yet!

Haven't you ever felt that way?

Haven't you often wondered, round about four o'clock, how on earth you were going to last out the other two hours?

Your job is no cinch, it's work—real hard going—from the time you start in the morning till you quit in the evening.

And so you don't want to make it any more strenuous by pulling and slaving at that old die-stock with its wide, jamming dies; with its binding thread tearing propeusities.

Get a

Premier Die Stock

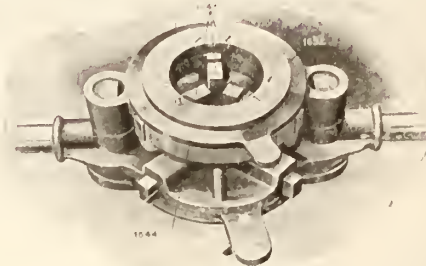
with narrow receding dies, that start on the pipe at full depth of thread and automatically back themselves off, and you'll find yourself feeling more fit at the end of the day, more able to look forward to the evening's enjoyment, less like going off to bed as soon as you get home.

The Premier takes only just enough power to cut the threads. Its automatic movements are accomplished without the use of lead screw or loose parts.

No. 1 cuts ½-inch to 1¼-inch right, left hand dies extra.

No. 2 cuts 1-inch to 2-inch right and left hand with the same dies.

Ask your dealer to show you one.

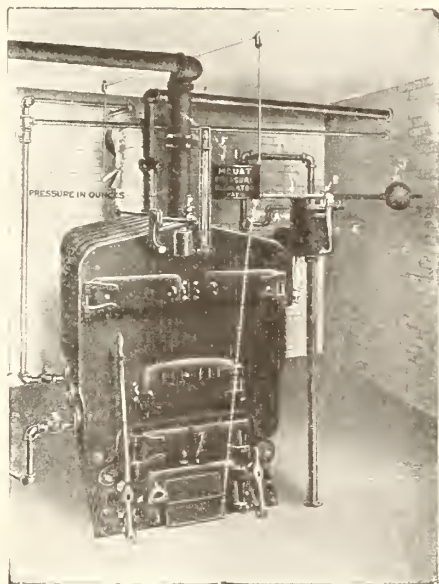


Rear View of Die Stock

BORDEN-CANADIAN COMPANY, Toronto, Ontario

The Mouat Graduating Vapor Heating System

Positive temperature control at each radiator.
Any fractional portion of a radiator may be heated to suit weather conditions.



The Mouat Automatic Vapor and Damper Regulator is the simplest, safest and most efficient device of its kind on the market.

Live heating contractors wanted to represent us in the Dominion.

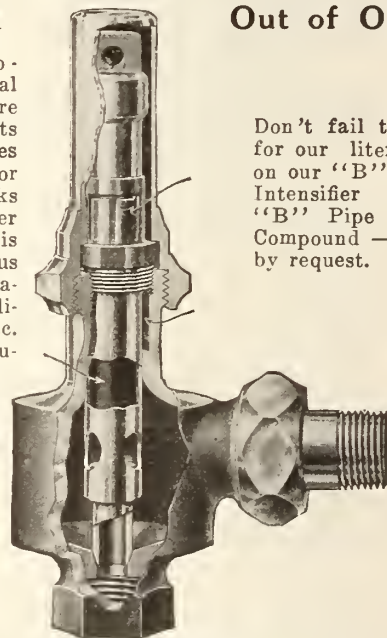
Write to-day for our proposition.

The Mouat-Squires Company, Cleveland, Ohio

NATIONAL VALVES

**Are Ordered and Reordered
—Never Get Out of Order**

National Thermo-static is an ideal valve. Its claims are based only on its deeds, and it does what is claimed for it and more. It works faithfully and never jumps its job. It is adapted to various work. For use on vacuum systems, radiators, heat coils, etc. No deformation troubles possible; the brass encased composition prevents it from being buckled or bent. More merits about the valve by writing for more information.



Don't fail to ask for our literature on our "B" Heat Intensifier and "B" Pipe Joint Compound — free by request.

NATIONAL STEAM SPECIALTY CO.

24-26 S. Clinton Street, CHICAGO
Surplus, Dunn & Co., 74 Murray Street, NEW YORK
L. N. Vanstone, 8 Wellington St. East, Toronto. Moncrieff & Endress, Limited, Scott Building, Winnipeg.

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."



Always ready
Always Right
Cuts 3 sizes

Nothing to Lose
Nothing to Adjust
Nothing to Break

You don't need to "dope" pipe joints where the "T.R.I.O." stock is used, because it holds the famous "L.G." Pipe Dies.



IT'S A PLEASURE TO WORK WITH "L. G." DIET.
THEY CUT CLEAN, SMOOTH THREADS EASILY AND QUICKLY AND THE T.R.I.O. STOCK HOLDS THEM IN A THREE-ANGLE GRIP TIGHTER THAN A VISE.

Pipe joints made with (L—G—)
Dies have stood this test

Many a time—without a touch of
lead, plumbago or any "dope" on
the joint.



CANADIAN
TAP AND DIE COMPANY
GALT, ONT.

KERR GATE VALVES

OUTSIDE SCREW AND YOKE

"KEYSTONE" PATTERN

Embody all the latest features



4½-in. and larger

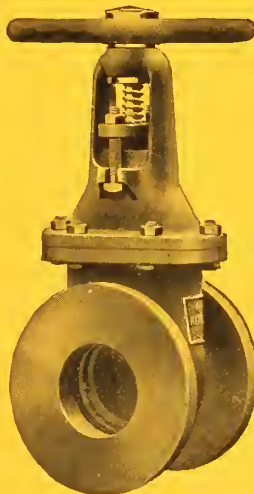
Screwed in Seats

Deep Bronze
Bushed Gland
and Stuffing
Boxes.

Full Opening.

Large Diameter
Hand-Wheels.

Solid Wedge
Discs.



4-in. and smaller

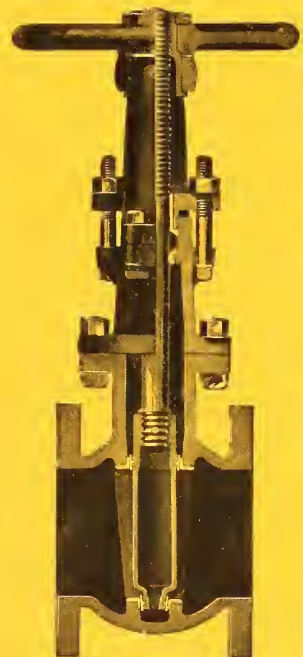
Narrow face-to-
face Dimensions

Symmetrical
Design.

Good Material.

Interchangeable
Parts.

Guaranteed
Tested.



4½-in and larger

The Kerr Engine Co., Limited, MANUFACTURERS
Walkerville, Ontario

TRADE MARK
GALT BRASS

Overflow Tube
Telescopes

Waste Tube
Telescopes



No Time Lost
Connecting
THE
"ADJUSTO"

Cast Brass Strainer

Cast Brass Waste Plug

Cast Brass
Coupling Nuts

Manufactured
only by

GALT BRASS CO., Limited, GALT, CANADA

WOLVERINE

QUALITY

Wolverine "One Piece" Basin Supplies

(Patented)



Separate Wolverine Flexible Joint Connection. Furnished on any $\frac{3}{8}$ -inch I.P. Basin Supply by specifying "C" after figure number.



Lead Cone Packing. Furnished on any Supply instead of Rubber by specifying "L" after figure number.



To receive $\frac{1}{4}$ -inch I. P. Tail Piece. Furnished on any $\frac{3}{8}$ I. P. Basin Supply by specifying "R" after figure number.

Special annealed brass tubing with slip joint nut for $\frac{1}{2}$ -inch iron pipe or with $\frac{3}{8}$ -inch I. P. Thread for floor or wall connections.

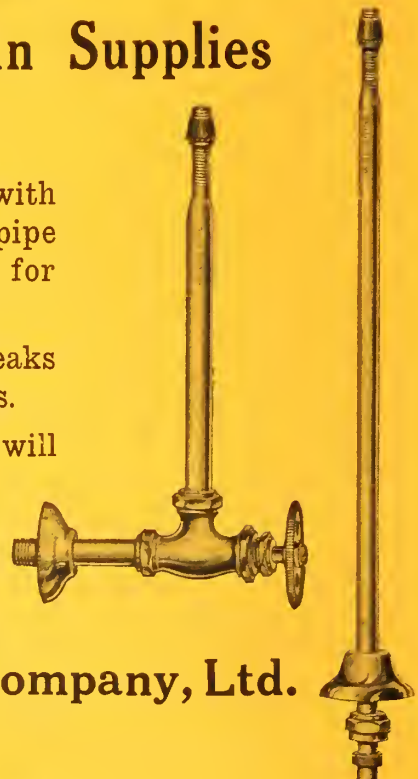
The Flexible Joint eliminates leaks at connections under the basins.

Heavy deep flanges which will not ding, as is often seen with inferior fittings.

Manufactured by

Canadian Wolverine Company, Ltd.

Chatham, Ont.



EVERY ARTICLE

GUARANTEED

THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 701-702 Eastern Townships Bank Bldg.
LONDON, ENG., 88 Fleet St. E.C.

TORONTO, 143-149 University Ave.
CHICAGO, 140 S. Dearborn St.

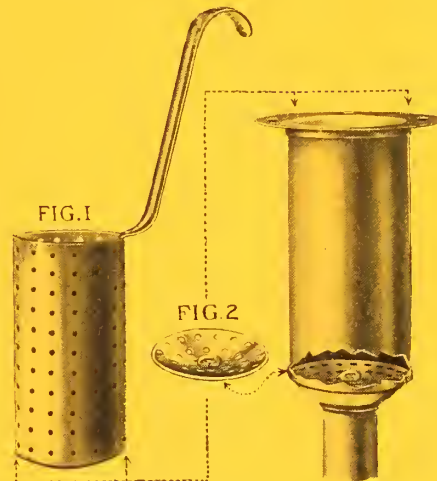
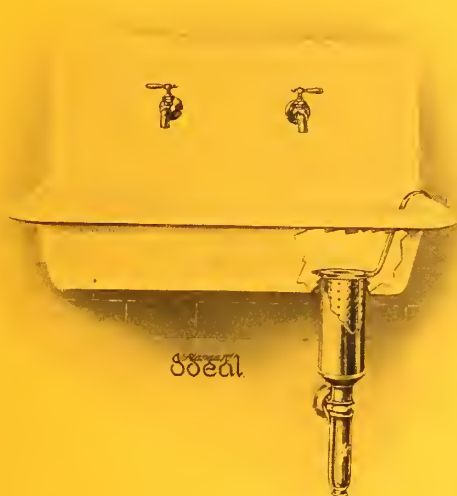
WINNIPEG, 34 Royal Bank Building
NEW YORK, 115 Broadway

Vol. VIII.

Publication Office: TORONTO, JANUARY 15, 1914

No. 2

Standard "S" **SANISTRAINER** - PATENTED -



F-321—18x30 Roll Rim Sink supported on Concealed Hangers, and with Sanistrainer.

LIST PRICE \$14.50

Fuller Bibbs and 1½-inch P Trap as shown, \$5.75 extra. **Additional Patterns in preparation.**
The **Sanistrainer** represents the most notable advance made in the improvement of Sink Strainers during recent years, and meets the demand for a Strainer that not only strains but also **COLLECTS THE REFUSE OF THE SINK** in such a manner that it can be conveniently removed, without coming in contact with the hands.

The combined **Refuse Collector and Strainer** (Fig. 1) may be conveniently lifted from the Sink for emptying and cleaning, and the liability of the Drain becoming clogged while the Strainer is removed is eliminated by a secondary Strainer Plate, as shown in illustration (Fig. 2).

The Sanitary and Convenient Features of the Sanistrainer should appeal instantly to any Housewife, and if these are displayed in your Show Room, they should become ready and extensive sellers.

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

TORONTO
119 King St. East

MONTREAL
42-44 Beaver Hall Hill

WINNIPEG
76-82 Lombard St.

VANCOUVER
410 Carter Cotton Bldg.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co.,
178 Victoria St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes,
120 Lombard St., Winnipeg

BRITISH COLUMBIA:
A. O. Campbell,
864 Cambie St., Vancouver



GENERAL OFFICES AND WORKS:

FITTINGS LIMITED, OSHAWA, CANADA

WAREROOMS:

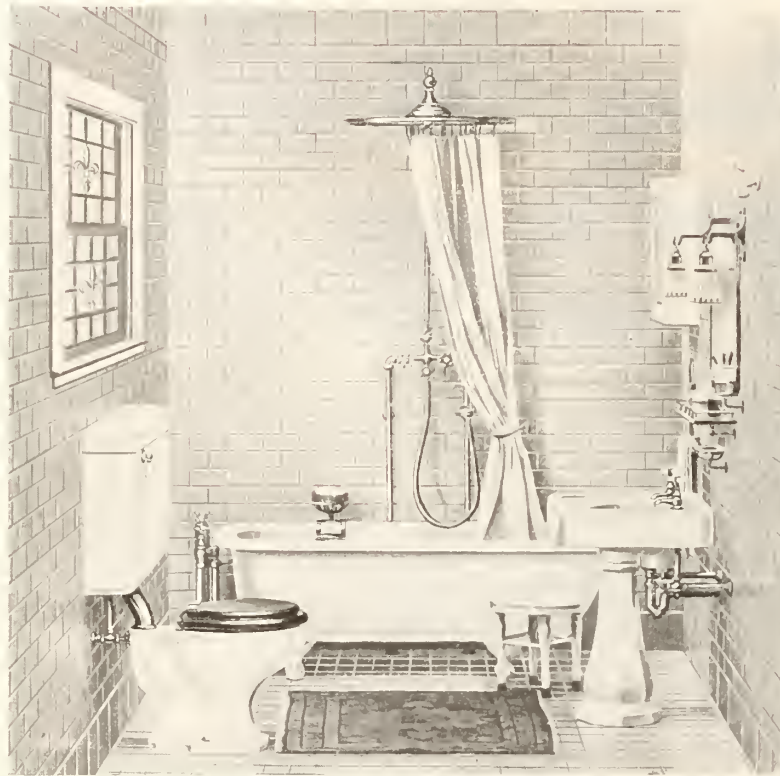
MONTREAL WINNIPEG VANCOUVER

CATALOG FURNISHED UPON REQUEST

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

“Standard Sanitary”

Modern Bathroom



Design P—60.

The bathroom illustrated above is an extremely well planned interior for a moderate sized house. The entire equipment, while inexpensive, is most satisfactory and practical.

The Closet Bowl is of the “Standard Sanitary” “Vitrite” porcelain, the surface of which is hard, smooth and non-absorbent, therefore highly sanitary, while the Tank is porcelain enameled.

Our long experience has particularly demonstrated the special fitness of porcelain enamel as the ideal material for Closet Tanks.

Enameled Tanks will not sweat, crack, need no lead, copper or other lining, and will not rust. There is no wear-out to the porcelain enameled Tank.

“Standard Sanitary” plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales agents throughout the Dominion.

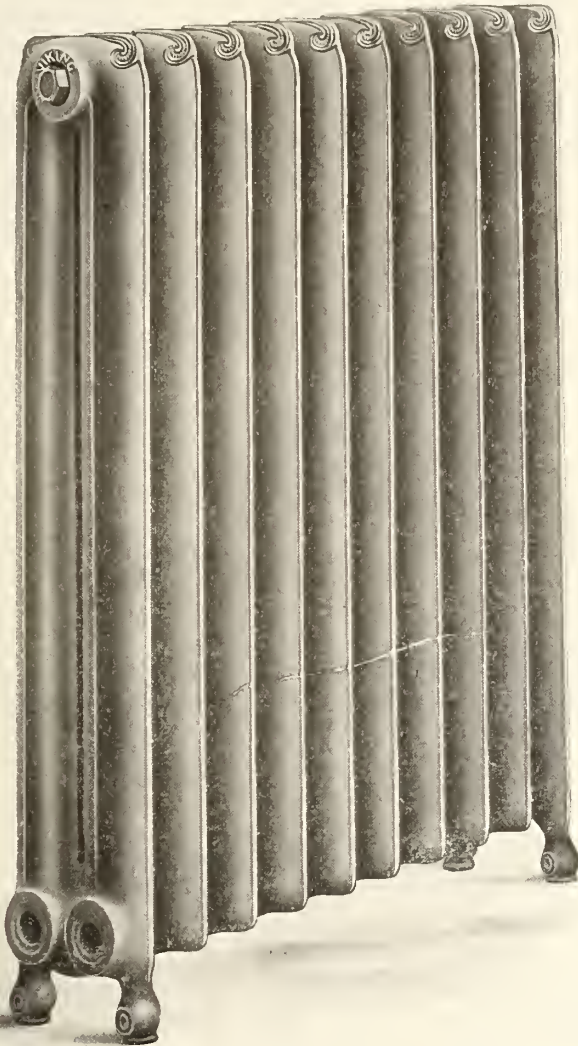
Standard Sanitary Mfg. Co., Limited

General Offices and Factory:

ROYCE AND LANSDOWNE AVES., TORONTO, ONT.

Toronto Store:
55-59 Richmond Street East.

Hamilton Store:
20-28 Jackson Street West.

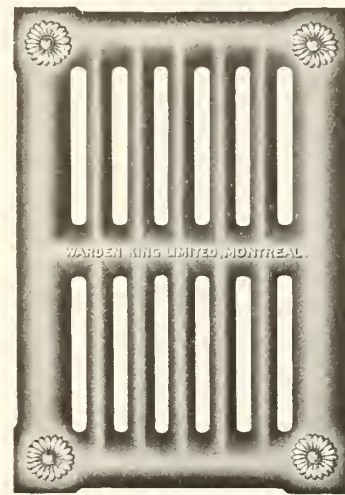


Just Out!

The New

“VIKING”

RADIATORS



These are the latest additions to our products, and are the neatest Radiators on the market to-day. They are fully described in our new Catalogue. Send for a copy at once.

We are the sole manufacturers of the celebrated “Daisy” Hot Water Boiler. Over 50,000 in use. This speaks for itself, and repair parts, if necessary, for any of the different styles, may be obtained at once.

WARDEN KING LIMITED, MONTREAL

Branch, 200 Adelaide St. West, TORONTO

AGENTS
IN
CANADA

The CRANE & ORDWAY CO., WINNIPEG, MAN.
The MECHANICS' SUPPLY CO., Limited, QUEBEC, QUE.
The JAMES ROBERTSON CO., Limited, ST. JOHN, N.B.
The WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

“When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.”

Gurney-Oxford Hot Water Heating Equipment

How One Steamfitter Made Good
on a



Hot Water Heating System.

"I take the credit of being the best fitter in town, and the Gurney-Oxford heating goods I've sold have helped put me there. Their Hot Water Boiler has always backed up my claims and given great satisfaction; and as for installing—it's just as easy and quick as any on the market. And if a grate bar needs replacing, I just pull it out and slip in another like a drawer of a table in two minutes.

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PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, JANUARY 15, 1914

No. 2

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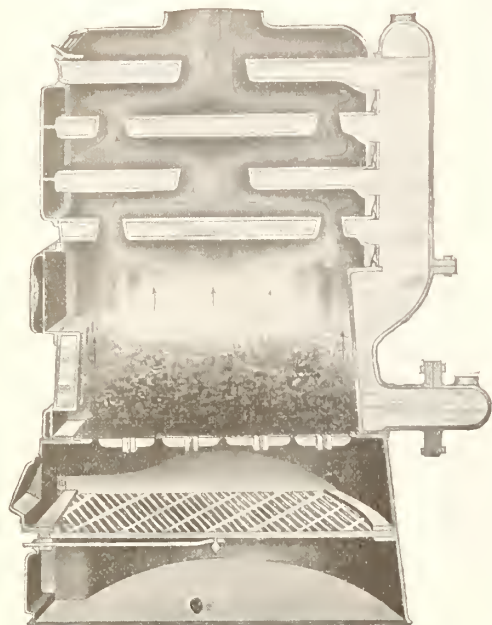
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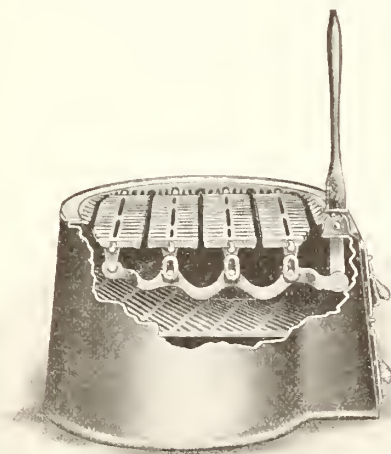
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THE SANITARY ENGINEER

VOL. VIII.

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No. 2

Examinations Necessary For Sanitary Engineers

This Article Deals With Several Phases of the Subject, and Arguments Are Taken up for and Against, Showing That the Public Health Must be Guarded Regardless of Personal Sentiment.

By P. McNeill, Inspector of Plumbing, Winnipeg, Man.

The Editor,
"Sanitary Engineer,"
143-149 University Ave.,
Toronto, Ont.

Dear Sir:—

At the monthly meeting of the local members of the Institute held on the 19th inst., the subject, "Examination of Plumbers" came under discussion. Many most interesting points of debate were put forward, and while those present were unanimous in their support of the trade being controlled by examination, a resolution was carried to the effect that the subject be left over for discussion at a future meeting. I have pleasure in submitting for publication a paper read by Mr. J. McNeill, for which I trust you will find space in your valuable columns.

I am,
Yours very truly,
J. MUTER,
Local Sec.

retical examination would be a hardship. We have known men who could hardly write their own name, yet were able to perform any practical part in connection with the trade to the satisfaction of all concerned; and if such a person were called to pass a theoretical examination he certainly would fail; then he would be prohibited from following that trade by which he makes his living.

Supposing a man who is in the heating



J. J. McNEILL,
Plumbing Inspector, Winnipeg.

IN dealing with this question of examination of plumbers and sanitary engineers there is one important feature which must be carefully considered, and which I am not clear upon, not having had any legal advice—namely, the legal aspect. If I am not mistaken there have been instances where the courts have sustained actions and set aside such by-laws as being illegal.

There are two points worth consideration which will suffice us. Supposing a by-law was in effect and a plumber, who was proficient from a practical standpoint, yet was not sufficiently educated to solve the many problems regarding figures, and reasons why he has to follow the certain by-laws enforced by cities and municipalities, to such a theo-

and ventilating business, who is not a practical plumber, desires to open up a branch in plumbing, so as to be able to fulfil large contracts without sub-letting part. We are all aware that in large buildings the plumbing, heating and ventilating is called for in the same tender. We have such men in the business today, who though not practical themselves, yet employ practical men, and invariably give less trouble than those who are practical. If called upon to pass a practical examination these men would fail.

To debar such would be an undue restriction, and if these persons were

to take action to quash such by-laws and sue for damages as being practically boycotted, would our courts uphold the by-law or sustain the parties taking action?

Question 1.

The first question that would arise in one's mind is, should plumbers have to pass an examination?

Question 2.

Why?

Question 3.

Who should be his examiners, and to what extent should the examination consist?

Some of the objections raised against examination.

Having a clear understanding as to the legal side of such examination we would be in a position to give a decided answer to these questions.

Answer to Question 1.

Personally, I would favor examination. Employers and the public are all too well aware of the value of proficiency, and for such our technical schools have been opened for night classes to educate the young generation, also to help those who are deficient in theoretical knowledge. It is the duty of those who are employers to encourage these employees to avail themselves of such opportunities. It is only reasonable that those engaged in plumbing should be thoroughly versed in its principles, and the dangers arising from faulty, defective and careless installation.

Answer to Question 2.

1st. Because of the close relation of plumbing to public health.

2nd. Because the public places confidence in the plumber to perform his work, which will be a comfort to them and their families, or a nuisance and a source of endless trouble, saying nothing of the expense to keep it in repair.

3rd. Because of the high cost of plumbing one should have the assurance that he gets full value for money.

4th. There is the possibility of inferior work being done by the repair

man, who has earned for the trade somewhat of an unfavorable reputation unless he is a good mechanic and has some conscience, he does more harm than good, and often it costs more to repair the damage he has done than that which he is called upon to repair. While making inspections we have discovered that the unscrupulous jobber has in the performance of a small repair cut holes in clean-outs, soil and waste pipes, and even cut away vent pipe, removed water closet bowls and not even repaired the damage, content to drive wooden plugs in holes and replace water closet bowl in such a manner as would not stand a smoke test.

Such work is done, knowing he is not called to test his repairs; this is where the inspectors are at a disadvantage. There are men following the repair work who, we are safe in saying, are retained in that sphere because of their inability to perform new work satisfactorily. To such an examination would be a great hardship, but a boon to the public by ridding the trade of incompetent workmen. If all who engage in the plumbing had a knowledge of its principles they would be more careful. It has been proved the stricter the law the better the mechanic and the class of workmanship. The great change in plumbing fixtures and material, such as the diminishing of lead, to iron and brass, has made it more easy for handy men to leave other callings and gather sufficient knowledge and nerve to call themselves plumbers and follow the trade.

5th. Why should the inspector be his teacher. We have come across men who could not give a reason why a fresh air pipe was necessary, where a house trap was installed, and who did not know where it should be installed. Such men when supplied with good material only destroy it, by installing it in such a manner that it does not pass inspection, and he has to change and rechange it till the inspector or architect is satisfied; even then such work that has been changed and altered so often is never the job it would have been if properly installed in the first place.

I am safe in saying that those who contend for examination invariably do good work, which is a pleasure to inspect, and I am certain the owner has the satisfaction that he has received good value for his money, and to such the inspector has pleasure in issuing a final certificate.

Answer to Question 3.

A duly appointed board, who will in no way be interested in the candidates, and who will give their unbiased decision, such examination should be provincial or State. But before this could be there would have to be the State by-law gov-

erning plumbing, a State examination to prevent a plumber who failed in a city where the law was strict, and the examination just as strict, from going to the nearest town where the by-law was not so strict, and the examination one of very little importance. Having passed in such a place, he could come back to the city and present his certificate, and would have to be accepted. Such board should have power granted remove any who would act in this manner. Direct questions bearing on the principles and difficulties that arise in everyday work, power to deal with such men who may not be practical, but are employing practical men.

Objections.

1st. Examination would be a restriction on how many would be allowed to follow the trade. To this I would say there is a certain amount of truth, and in some cases restriction is what is wanted, such as has been mentioned.

2nd. Limiting open competition and the possibility of increasing prices.

3rd. Why should a man who can perform the practical part be prohibited because he cannot pass a theoretical examination which may amount to figures?

4th. There is a question asked which is more of an objection, why should there be any examination when the public hold the inspector responsible? Plumbing, not the plumber, is governed by by-laws, and before work is begun a permit has to be granted only on approval of plans submitted, and then the work has to be carried out and inspected in accordance with the by-law.

5th. The plumber is not always responsible for the way plumbing is laid out. He has to work under instructions from the architect.



THE FLUELESS GAS HEATER.

At this time of the year, when many feel that it is not cold enough to use the general heating system of the house, but is too cool to be entirely without heat, the use of portable gas or oil heating apparatus is a great convenience. Cleanliness and comparative low cost of operation make this type of heating deservedly popular. Unfortunately many of these heaters are used without a flue pipe to carry off the products of combustion. The use of such heaters is to be depreciated. This is especially true of those devices of low efficiency that make it practically imperative that the doors and windows be kept closed if the object sought—that of raising the temperature of the room—is to be obtained. These heaters put a premium on insufficient ventilation. The current issue of a high-class monthly magazine carries a full-page advertisement of a gas heater that is specifically recommended for

use in the children's play room. It is advertised as "the ideal heat for the nursery," and in heavy type the claim is made that it "will not vitiate the air." Such advertisements are dangerous, say The Journal of the American Medical Association. There may be times when one is willing to sacrifice health for comfort for a short time; when an increase of temperature in the room is sought even at the expense of vitiated air. When this is done with a full knowledge of possible dangers it may not be too severely criticized. But to lead people to believe that any room can be heated healthfully for any length of time by means of flueless gas or oil heaters is dangerous doctrine. An efficient gas or oil heater with a flue attachment is an admirable piece of household apparatus; a flueless heater—except for the most temporary use, and then used with a full knowledge of the dangers involved—is an abomination.—Plumbers and Gas Fitters Journal.

Here is a measure which should be thoroughly looked into by our health departments in Canada. We have too much of this fake advertising on the market, and as the American Medical Association journal states. It is dangerous. Sanitary Engineer has and always will advocate that there should be a department of health to look into the heating of our homes as well and the sanitary disposal of sewage, etc. The proper heating of a home or room is as much a sanitary matter as the other. All the fine fixtures, good methods of piping and venting of traps, etc., will be of no avail if we are to breathe vitiated air. These heaters are bad. Another contrivance too, such as a gas log and gas fires which are being placed in fireplaces, and which are not equipped with a flue are dangerous and should not be countenanced for one moment, but they are. There are scores being placed in homes, by the irresponsible speculative builder. Hence we feel that some authoritative body should have the heating and ventilating of our homes as well as offices and factories in which the largest portion of the human race spend most of their time.—Editor.



MANUFACTURING OF METAL FOILS.

The Canada Metal Co., Ltd., have recently installed 5 new additional rollers to be operated in the manufacture of several kinds of foils, viz., tinfoil, leadfoil, tea lead and electrotypers' solder, this will mean they have also to increase their motive power to the extent of 200 horse power.

It is claimed the new addition to their plant will enable them to execute all demands made upon them for this material.

Wooden Septic Tanks Allowed in a Canadian City

Showing That if Such be the Case it May be Reasonable to Conclude That Other Sanitary Matters Are no Better—Brick Laid in Cement or Solid Concrete the Only Known Sanitary Method at This Date of Building Septic Tanks.

IN a case which recently came before a special Sanitary Committee comprised of the city council, reports a Canadian daily paper, a sanitary engineer made several charges against the city engineer and the plumbing inspect-

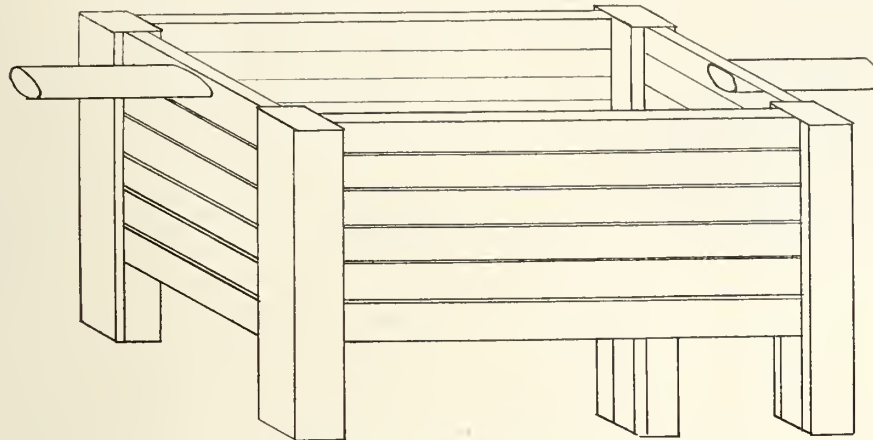
gradually find itself becoming a veritable bed of filth. "Sanitary Engineer" is no alarmist but feels like the Irishman who applied for a situation as coachman and was asked how near edge of a certain cliff he could drive his vehicle without

the people to live under dangerous conditions.

Then apart from the sanitary standpoint there is the first cost. If a wooden septic tank be permitted, we must take it for granted that the very best lumber is used. If that is so there needs to be good screwed joints where the syphon or other flushing device is coupled up to the wood tank. These if properly made cost much more than the ordinary fittings which are used when brick or concrete is used. These would add to the cost; in fact if we were asked which would be the cheaper we would certainly state that concrete would cost less and be far better. In fact the life of a concrete tank is not known as we have never heard of one giving out if properly made. We are reproducing a sketch of wooden septic tank which has been and is being installed at the present time (in the city we have in mind). We could scarcely realize that such a condition existed. Hence we wrote and procured copies of the plumbing by-laws. We were however assured that such was the case, and that the by-laws do allow wooden septic tanks.

Are Not Really Septic Tanks.

Any of our readers who have had any experience with septic tanks will see at a glance that our sketch is not entitled to the term of septic tank. It has no



An unsanitary installation.

or. There is evidently some little local grievance in connection with matters of sanitation in that fair city. But whatever may be the cause the city engineer makes a rather strange admission when he quotes as follows:

Septic tanks, Section 15.—These tanks may be constructed of brick, wood or concrete. If for a permanent construction, concrete is recommended. But if the city sewers are likely to pass the property in a few years a wooden tank can be put in.

Then this engineer goes on to state.

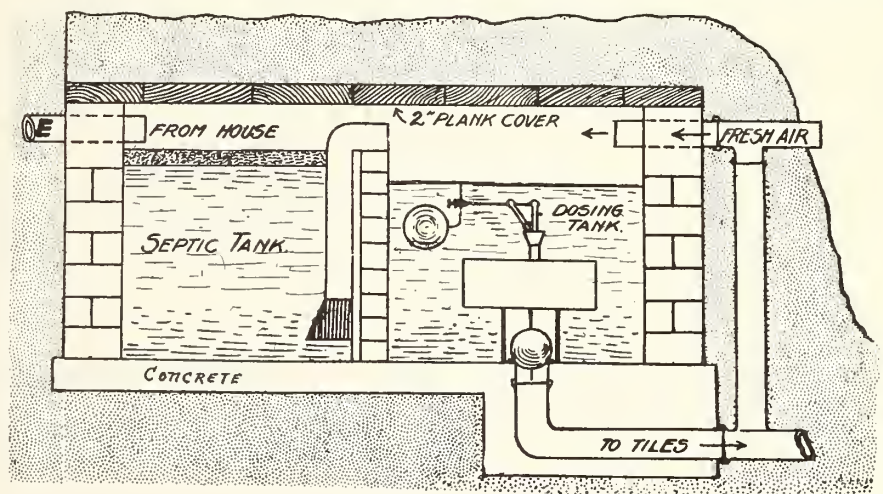
"But in any case it is impossible to take action against the construction of any septic tanks unless it can be proved that the same are a nuisance and dangerous to the public health."

What are our towns and cities doing to allow by authority the use of wooden septic tanks? It is the first instance we have had brought to our notice, where, at this date and period of progress, wooden septic tanks would actually be permitted. No one would imagine a practical up-to-date sanitary engineer ever giving wood the slightest consideration.

From a sanitary standpoint such a condition is disgraceful and we regret to learn that such is the case, which must be a fact when the wording of section 15 is acknowledged. Such matters as these should be altered or the day is not far distant when such town or city will

falling over replied "Shure, Sor, it's not how near I'd be after thrying to drive, but be jabers how far I could kape away from the edge."

It is the same in using inferior material for temporary purposes. It is by no means temporary if there is a possibility of such a septic tank being in use for two years or more. Sanitary Engi-



neer stands for prevention and not cure. 90 per cent. of our diseases are caused by unsanitary conditions. If there is a Canadian city to-day allowing wood to be used for septic tanks, it is taking a great risk of polluting the soil in no small degree. It is endangering the health of its citizens. It is permitting

dosing chamber. It is built of 1 in. lumber with corner posts. It does not contain any kind of a valve as far as we can learn, and is really nothing but a filthy box which holds a certain quantity of sewage, which has not chance to act in a way which a septic tank would need to act.

Heating and Ventilation Past, Present and Future

These Articles Will Take up the Simplest Methods Adopted in the Past, the Present and the Possible Methods for the Future, and Will be Written as Free From Technical Phraseology as Possible, so as to be Within the Scope of the Lay Mind.

FROM the most early races of man up to our present time, some form or other of, shall we say artificial method of warming has been necessary.

The ancients for most part used open fire places, in which large logs of wood were burned. This method was in use in all countries until the advent of coal. We have all learned how those who discovered coal, were subject to harsh treatment, and were taken to the market places and burned to death. In those days all progressive measures were subject to oppression in some way or other.

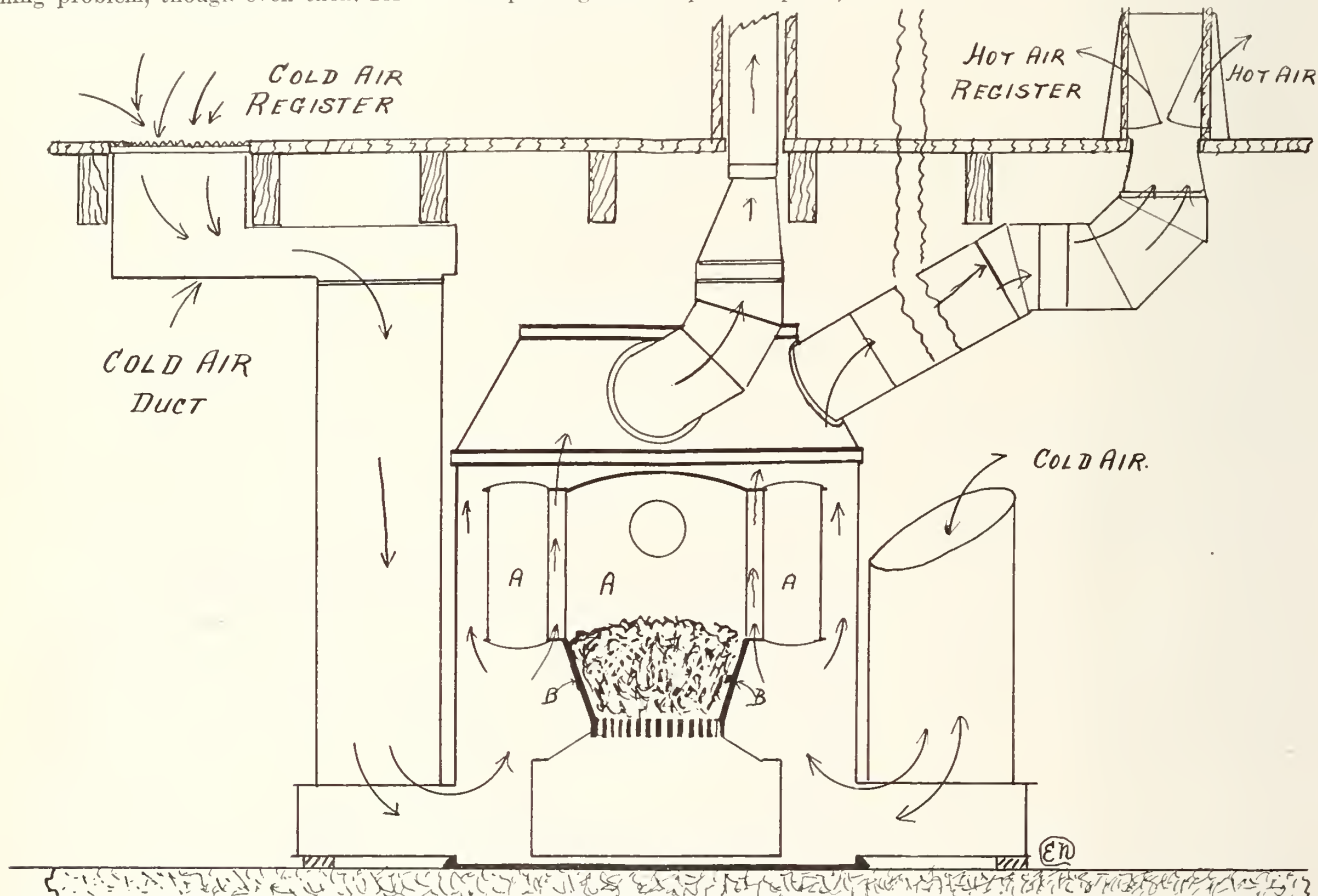
However the advent of coal was the first step toward revolutionizing the warming problem, though even then, for

the small crevices of the stones thus enabling the coal to burn. Later we are told of square stones being built so as to form a grate. We then pass on to another stage, though still using the open fire place. This was the adopting of regular iron grates similar to our present open fire grate, which in some climates are the only method of house heating adopted to this day. However even under these same climatic conditions which prevail in Canada and the U. S. A., the open fire place was used for a long period.

Since that period several methods of heating have been adopted though with the dispensing of the open fire place, our

of fuel, either wood, coal, oil or electricity. In California the sun's rays are being used to generate steam by the manipulation of parabolic reflectors and lenses, etc. It is said that Edison is also working upon an invention which will collect electricity from the air and be used in conjunction with the dynamo and motor. However stoves at this date are the simplest and cheapest method of house warming. The heat is diffused by radiation and convection to the space in the apartment which it is placed in.

The warm air is simply allowed to circulate through the different rooms, and, when such stoves or heaters are used, the best results can be derived by plac-



Showing travel of air in a hot air furnace.

a great number of years the open fire place still held its own, except that with coal as fuel a very primitive method was adopted. In some cases we are told that large round stones like boulders were collected, then a number of smaller ones placed between the crevices to prevent the coal from filling up the spaces. Then sticks were laid upon these, then coal on top and the air was drawn through

ventilation has suffered materially. Little or no consideration is given to ventilation when building our residences, factories or offices. It must, however be stated, that great strides are being taken in this way particularly, when building our public institutions, etc.

The Stove and Heater.

All systems of warming must be accomplished first by the use of some kind

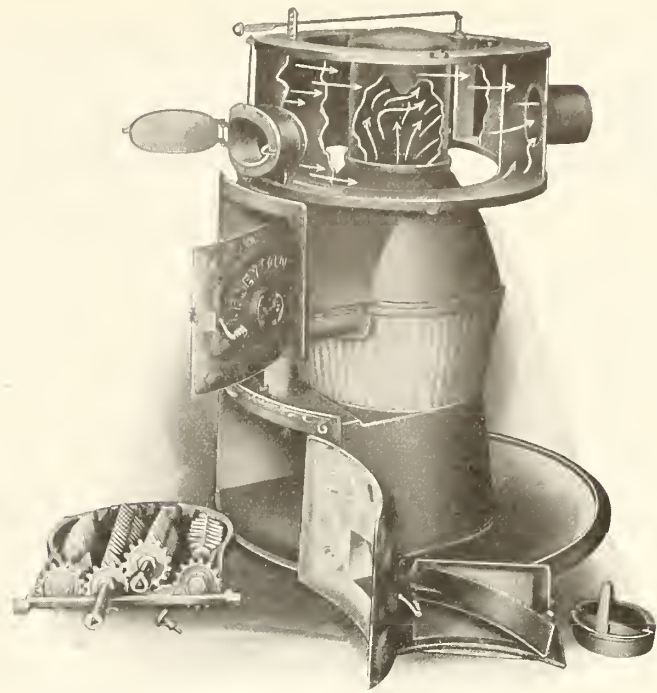
ing them say on the ground floor in a main hall, then allowing each door of the different rooms to be opened and opening the windows a very small space, this gives the warm air an upward motion which can readily escape, as well as to a certain extent establishing a simple form of ventilation.

Hot Air Furnaces.

We will now take up the general use

and practices involved in the use of the hot air furnaces. These pieces of apparatus are in reality different forms of large stoves or heaters, with large combustion chambers of various kinds, all made with a view of retaining the heat as long as possible on its way to the chimney or smoke pipe, taking care that these chambers or passages do not interfere with the draft. A series of slides and shutters are inserted into these chambers so as to either shorten or lengthen the travel of heat. These are then enclosed in a casing of sheet iron, chiefly galvanized. We are showing different types for the purpose of better illustrating the different methods adopted. These outer casings or bodies, as we will now term them, along with the interior heater, are the only parts which constitute a furnace of the hot air type. From the top of these casings are taken a number of pipes made of either tin or galvanized iron and are used to carry the warm air to the different rooms above.

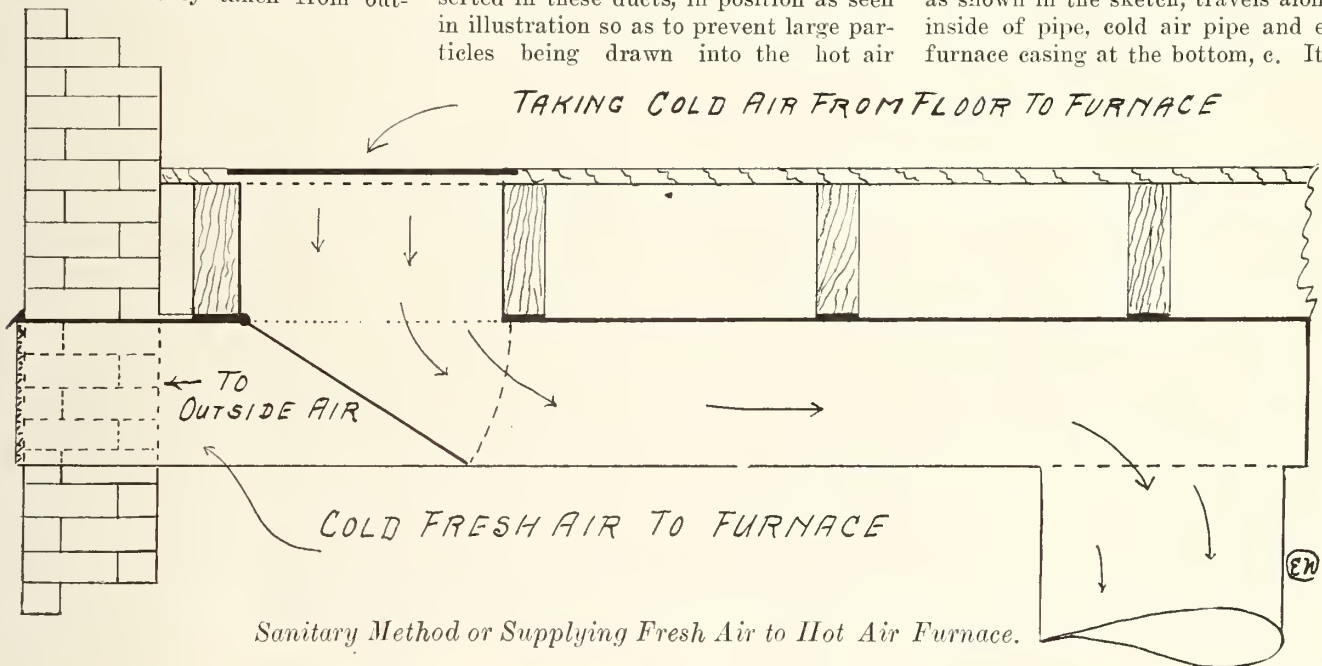
Then a supply of cold air must be conveyed into the furnace by means of large pipes or ducts. These should by rights be taken from some point out of doors, (though we regret to state that, very seldom are they taken from out-



By the courtesy of Messrs. Gurney Foundry Co., Toronto.

building to close the outside off and take air from the floors. In any case a very fine screen of wire netting should be inserted in these ducts, in position as seen in illustration so as to prevent large particles being drawn into the hot air

stalled. They will never be so installed until there is a federal law controlling the proper installation. The air enters as shown in the sketch, travels along the inside of pipe, cold air pipe and enters furnace casing at the bottom, e. It then



side) and connected to the bottom of the furnace.

We have shown in previous articles on this subject that all cold air ducts should be to supply fresh air to the furnace and unless they are, such an installation cannot claim to be as sanitary as it might be.

Of course, even if these pipes or ducts were placed in such a manner as to take air from the outside, a simple form of controlling device might be made as shown in Fig. A, to enable occupants of

chamber. Many fires have been found to have been caused by an accumulation of this dust and dirt which has caught fire in the interior of the casing and has spread rapidly through the house. This style of furnace should be equipped with water pans, and care should be taken to keep them full of water, thus causing the atmosphere to be kept humid.

The whole principle is very simple and is the cheapest form of furnace that can be installed and no doubt would be more desirable if properly and sanitarily in-

stalls or expands over the surface of the fire pot B and radiators A and rises into the upper pipes. These pipes diffuse the warm air into all parts of the building. Note the lines of travel.

The great trouble with hot air method of heating is, if the furnace is rather small and fuel needs to be burned rapidly, thus causing a high degree of heat, which in turn has to circulate and become mixed with the air in the rooms.

No air is fit to be inhaled which has
(Continued on page 16.)

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TORONTO, JANUARY 15, 1914

THE LICENSE QUESTION.

In our last issue we took the matter up of licensing of men who were not capable of installing work, such as our craftsmen are called upon to do. We gave several reasons why such men should not be licensed, we showed the dangers arising from work having been done in a slipshod manner, and which, in a very short time, would be a menace to the health and lives of humanity. We pointed out that a board of examiners should be appointed, etc., and that persons being granted authority to instal work of such a vital nature should be efficient men.

Both Journeyman and Employer.

Not only should the journeyman be a practical man, but also his employer, providing that employer actually did work with the tools. However, while the employer, if he be merely in the business from a speculative point of view, be licensed, this license would not in any way authorize him to instal work. Hence, it will be seen, though he may be entitled to hold a master plumber's license, he must show that he is going to carry on a legitimate business. We have had cases brought before our notice where a man has first obtained a license, bought his goods, and then got men to instal the goods in any old way. This is done mostly by speculative builders, who sell their houses to the home seeker. The sanitary and heating installation has been found to just barely pass the test, and in a very few weeks, repair bills are the order of the day.

We therefore endorse a rigid examination of all, both journeymen and employer, who are going to play an active part in the actual installing of such work, because it is of such a vital nature, and is a class of work which is to play a serious part in the future health and welfare of humanity as a whole.



THE REAL MAIL ORDER MENACE.

The menace of the mail order houses does not exist in the fact that the catalogue price is lower than the retail price. The table of comparative prices published elsewhere in this issue establishes the fact that on many

hardware lines at least, the mail order catalogue does not offer the people any considerable reduction under the prices that the retail hardwareman offers his goods at—certainly not enough of a reduction to outbalance the disadvantages of buying by mail.

The growth of the mail order business can be attributed to one factor, therefore. They have developed a new field. The farmer living some distance from town seldom sees a newspaper and rarely gets in to visit the stores. Up to the time that the big catalogues began to circulate, he was left pretty much to himself, to buy what necessity impelled or his desire dictated. He was practically an unworked prospect. The mail order houses realized the opportunity and they began to reach this unworked prospect by a publicity campaign conceived and carried out on a gigantic scale. And it worked; fully up to the expectations of the men who had grasped the idea. The isolated buyer saw things in the catalogues reaching him which would never have appealed to him otherwise, but which now aroused the desire of possession. His wife caught the fever faster and in a more virulent form than he did.

The remedy from the standpoint of the local dealer is to reach the isolated buyer as well. It can be done in various ways, by advertising, by keeping up a well-stocked and thoroughly attractive store, by giving the best of service. The last consideration in a sense includes all the others.

To sanitary engineers this class of business involves another cause for alarm, though up to the present it has not been felt.

The writer had some experience where persons were able to buy goods such as baths, lavatories, and all their fittings from an out of town mail order house and then get poor, cheap, inexperienced men to instal the work. This is not by any means right or proper. The public are not aware that such work done is not O. K. until afterwards. Then finding the installation poor, simply have to for ever after be paying repair accounts.

Further, the health of the people is jeopardized.

EDITORIAL COMMENT.

It is more blessed to give than receive (if you haven't earned it).

* * *

If sanitary engineers would look after their own leaks, they would reap a greater reward than looking after other people's leaks.

* * *

The business of religion is now giving place to the religion of business; and the trade paper is the evangel of the true brotherhood of co-operation and self respect.

—Elbert Hubbard.

GIVE more time to your trade paper and you will be BLESSED in acquired thought, etc.

* * *

Show me the man who subscribes to and reads his trade paper, and you show me a man who will "show me"—

* * *

—Elbert Hubbard.

The man who says he has no time to read his trade paper is generally one who thinks he knows it all and keeps on thinking.

* * *

The man who reads his trade paper gets the habit of doing more than think.

Plans of Work Recently Installed in a Canadian Public School

This Article Treats With the Subject of What is Being Allowed by Way of Poor and Non-mechanical as Well as Unsanitary Installations in Cities and Towns Where Unqualified Men Are Employed as Plumbing Inspectors.

Article No. 2.

In our issue of December 1st, 1913, we published an article under the same heading as the one we are now taking up. It dealt with the installation of sanitary engineering which had been installed in a public school recently. Since that date we have received letters from all parts of the Dominion asking if it were possible for such work to have actually passed through the hands of a

to show how, in our opinion, they should be installed. In the first place (as far as we learn), these w.c.'s are installed to waste into 4 x 4 sanitary T.Y.'s, as shown, which means they waste in too vertical a manner. It is very poor practice to adopt such a method. All waste from fixtures, such as w.c.'s in batteries such as these should be placed as follows: The horizontal fittings should be

tance from the terminus. Thus, by allowing the waste to flow into fittings in the form suggested the downward course is not too straight.

We have found it to be good practice to always make a point to use a full Y and 45 degree or $\frac{1}{8}$ bend when room permitted in preference to using an ordinary T.Y. fitting.

We have shown in Fig. 2 the way this

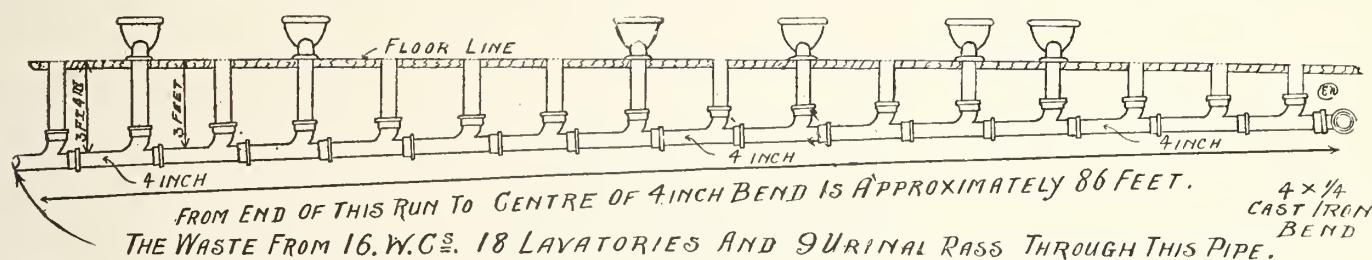


Fig. 1. No back-vents on these. Note the distance from floor to centre of 4 inch cast iron drain.

plumbing inspector. Some suggested that we must be exaggerating it a little. To these and all other queries we may state that such is not the case. In another article we are showing other installations, which are not only being passed by this same (so-called) inspector, but are actually permitted by authority of the Board of Health.

In Fig. 1 will be seen a sketch of 16 w.c.'s, all emptying into a 4-inch soil pipe. We produced this in a previous issue, but were asked by one of our readers to further describe this same installation again, and at the same time

laid on an incline with the branch at an angle of 45 degrees or so.

For instance, in this case take a Y and lay it down with the branch inclined at 45 degrees. Then insert a 45 degree bend, which gives an almost vertical outlet. Then into the 45 degree bend put either another piece of pipe, if the distance demands it, from floor to the 45 degree, or in some cases only the ferrule and lead waste pipe is necessary. The idea is when a w.c. has too long a vertical drop there is more danger of syphonage, even though it is back vented, providing the vent is a long dis-

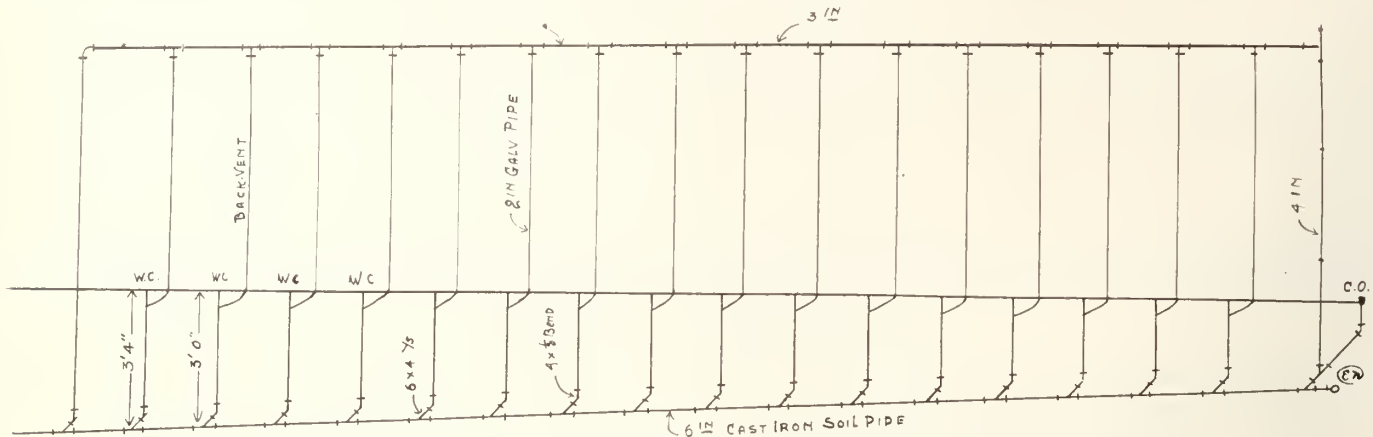
battery of 16 w.c.'s should have been installed, though we are aware some authorities claim that every w.c. should not need to be vented. The position we take is that it is the best and safest practice which has been evolved up to the present day. It will be seen by again looking at Fig. 2 that we have placed a trunk vent at the deepest end. This end is nearest to the main drain, as well as a vent to each w.c. The reason for our so doing is this: In such places where it is very likely that five or six of these w.c.'s may be in operation at once, and, say, there was five or six flushed at once,

and these were, say, two from the end nearest the drain, there would be a great chance of causing a certain amount of back pressure on those two w.c.'s, particularly if there was a main trap in use. But where no main trap was used, a certain amount of the air would circulate over the w.c. vents instead of through them, though not all. Hence,

And we feel that what is really needed is a general code where the principles of sanitary engineering is the same in all parts of Canada. Then each local condition could be dealt with upon evidence shown by a Federal board of sanitary engineers. Nothing will give such results, and nothing will solve the problem of practical men as inspectors

tank, than to allow it to be collected and stored, then really overflow.

So as to show what a septic tank is, we are again reproducing one, and at the same time describing it in a simple way. All forms of septic tanks should have two divisions, the sewage enters at E in Fig. 2 which is the terminus of the house drain. No trap should be placed in this



Method of back-venting W.C.'s, when such a large number are installed in a battery.

for all the extra cost it would be the safest method.

Further, it will be seen we have a clean-out place at the end of the line, and raising up to the floor. This should be always inserted in such a length, and many a time there is none put in because of there being little or no room for such fitting between the w.c.'s. It is all a matter of sound, good, practical judgment, and we should one and all strive to put our whole heart into the work. At one time it was thought that the venting practice was carried too far. We agree with such a thought. We feel that backing venting is wrong if enforced under every condition. It is wrong to insist on back venting a w.c. on, say, a top floor, when no other fixtures are on that floor, and it is the highest fixture; and one of the evils at the present day is the enforcing of such things that are not necessary.

What is wanted is men who know each and every condition; when and when not to vent, re-vent, or back vent.

This enforcing wholesale of vents has given rise to more bad feeling than any other technicality we know of both amongst the public and those of our craft who knows such to be the case.

Wm. Paul Gerhard, C.E., who is recognized as one having a high authority in matters of sanitary engineering, states in part, when referring to this question of back-venting: "I have for many years made strenuous efforts in favor of a simpler but equally safe system. Other prominent authorities in sanitary engineering have, from time to time, entered protest against the prevailing methods of doing work."

being employed as a Federal law on sanitary engineering.

HEATING AND VENTILATION,

(Continued from page 13)

been heated to more than 150 degrees fahrenheit, for the simple reason that all organic particles in the air which come into contact with a higher degree than 150 degrees will char and produce a peculiarly close odor, which is also too dry.

Hence the most desirable features in a hot air furnace are: First, large area of combustion chamber, allowing a slow burning fire, which is the only economical way to burn fuel of any kind; Second, large radiating surfaces.

These combined will generally give far better satisfaction than a quick acting furnace, which emits hot air, and while we are frequently naming such furnaces as "hot air" they really should be simply warm air, and as stated before no warmer than 150 degrees Fah.

Almost any kind of fuel may be used in these furnaces, oil, gas, coal or wood. We have shown our readers several forms of heaters.

(To be continued in our next issue.)

WOODEN SEPTIC TANKS.

(Continued from page 11.)

Any one knowing really the duty which a proper septic tank is called upon to do, would never tolerate such work as we here show. It would be far better to let the sewage drain away without a

pipe, as by doing so it would prevent a free flow of fresh air, which is absolutely necessary. It will be seen the fresh air travels from the air pipe to the top of the roof of the house. In Fig. 3 we show the proper method used in laying the necessary irrigation tile pipe from pipe C at the bottom of the tank. In our next issue we will publish an article dealing with this subject in full.

IMPORTANT REDUCTIONS IN EXPRESS RATES.

The Railway Commission, in an order issued Jan. 9, made some important reductions in express rates, to become effective February 1.

In cases where the rates per 100 pounds are 90 cents, the reductions in the present minimum charges are: 2 pound parcels, 5 cents; 3 pounds, 15 cents; 4 pounds, 20 cents; 5 pounds, 15 cents; 6 and 7 pounds, 25 cents.

Where the rate per 100 is a dollar, the reductions in the minimum are: 2 pounds, 5 cents; 4 pounds, 15 cents; 5 pounds, 10 cents; 6 and 7 pounds, 20 cents.

Where the rate is \$1.25 per 100 the reductions in the minimum are: 2 pounds, 5 cents; 3 pounds, 10 cents; 4 pounds, 15 cents; 5 pounds, 10 cents; 6 and 7 pounds, 15 cents.

In cases where the rates are \$1.50 per 100 the reductions are: 2 pounds, 5 cents; 3 and 4 pounds, 10 cents; 5 pounds, 5 cents; 6 and 7 pounds, 10 cents.

Where the through rate is \$1.75 per 100 there is in the case of 2, 3, 4, 6, and 7 pound shipments a reduction of 5 cents in the minimum charge.



Back row—R. Nelson, J. Snell, J. R. Davison, R. Talbot, G. Delaney, R. Phillips, S. J. Swayze (partner), B. Barnard, A. Lardeur, L. Nesner, S. Gibson, J. Stark, E. P. Paulin (partner), Front row—W. R. Leathorn, P. Filleul, E. Pethrick, G. Scougall, A. Henderson, W. H. Cowell (bookkeeper), H. Sharp, G. Cartwright, A. Zech, C. Atkinson, L. Nesner.

A Progressive Firm of Sanitary Heating and Ventilating Engineers in Regina Alberta

Showing How Their Business Has Expanded During the Year 1913, in Spite of the Cry of Financial Stringency Which Has Been Heard Throughout the Dominion.

IN this issue we have pleasure in putting before our readers, a photo of the establishment belonging to Messrs. Paulin and Swayze, of Regina, Alberta, along with their employees. This photo was taken in December, 1913. It will be seen that no snow is on the ground. (A very remarkable occurrence we think for the month of December.) This state of the weather has, however, been felt all over the Dominion. It has certainly been a very open winter so far, let us hope we will not suffer for it in the spring. This progressive business was opened up 3 years ago by Mr. E. P. Paulin, late of Goderich, Ontario, and we are sure his Goderich friends will be pleased to hear he is making such progress. Mr. S. J. Swayze is also an Ontario boy and hailed from Hensall. "Sanitary Engineer" joins right here in

wishing them all the luck possible, and we all know that the real compound of luck is concentration of energy and honest labor. These two lads left their homes with a spirit of progress, else such results as have been attained by them, would not have materialized in so short a period.

What is really lacking in the hearts of most of our craft is the spirit of honest progress. Messrs. Paulin & Swayze carry on the work of sanitary engineering, heating, and sheet metal work, and when asked how they had found business stated in part.

"The business in Regina for the past year has been very good, in spite of the financial depression which so many other cities throughout Canada have felt." They employ as fine a class of men as

can be gotten and, at this date, when the photographer peeped in on them had then numbered no less than 24 employees besides the two partners of the firm, making a total of 26.

Speaking of the year's business done they inform us that the increased amount of their payroll was over \$3,000.00 more for 10 months of this year than for the same 10 months in the previous year.

As will be seen, they make use of a motor truck on their business, our readers should note the method adopted by them to enable loading long lengths of pipe. They have a series of loops or brackets 3 in number thus a large quantity of pipe can be carried on both sides, when it is necessary.

(Continued on page 21)

The Toronto School Tender System a Farce

Now That the Investigation Into the Methods Adopted by the Toronto Board of Education Re the Heating, Plumbing and Ventilation Contracts is Closed, and a Verdict Given, "Sanitary Engineer" Feels it Can Speak a Word or Two Re the Matter.

AS Judge Winchester states, "Careless methods, lack of system and general mismanagement is the chief cause of the trouble." We, too, are of the same opinion, and have always held such an opinion. The whole trouble is, a lack of practical experience on the part of those placed in charge of such matters.

Too Vital.

The problem of heating, ventilating and sanitary engineering is becoming more scientific. It always was a vital problem, but humanity had not come to such a stage of realization to the needs of such work being properly installed. These accomplishments are becoming more of a professional nature every day. They require experts to inspect the installations as well as the actual installing.

The plumber and steamfitter is as dead as door nails at this day. He is a sanitary or heating engineer, or both combined, and a person taking or being given the responsible position of inspector, or superintendent of such work should in all fairness to both be a man of practical experience, so as to watch the interest of the people, whose servant he really is.

Such a person is the watch dog over our welfare. These matters are of such a vital nature that we must have them as perfect as present day science and engineering possibilities will allow.

Then, such being the case, it stands to reason that experts should be employed.

Thorough Practical Specifications Necessary.

We will now review such matters as they really are, referring to specifications.

These are generally drawn up by an architect, and nine cases out of ten they are so loose and slipshod, that anyone could drive a team of horses through them. As a whole the specifications are too general. They are neither fair to owners or the sanitary and heating engineer, and when all boiled down simply amount to this: The engineer who is best known gets the job, and there is too much work, wheels within wheels. In some future issue we will analyse several sets of specifications sent out for our craft to tender upon, and show the weakness of the present system. These

specifications should be drawn up by those of the craft. Several plans could be submitted, say of heating, ventilating and sanitary engineering. These plans should carry along with them their tender, in every case.

Here are a few instances: A person asks an architect to prepare plans for a building. No matter for what purpose. The plans are finished and o-k'd by the owner, then tenders are asked for the sanitary and heating work (very seldom is the matter of ventilation taken into consideration). The sanitary and heating engineer prepares his own plans, and sends in a tender, there are, we will say, half a dozen such tenders sent in, but please note that the plans are not submitted, and the tenders do not give any idea what kind of a job is going in. It may be the highest price is actually the lowest, if the class of installation is only considered, but such is not done. One of the reasons that the public feel that they are so badly treated is, they do not get these tenders put before them properly, and too much is left for the architect to decide. But when any trouble arises the latter is always clear. It is the same with our public institutions. Material is often specified which is unnecessary, installations are planned in too general a way and the engineers know it. They know the lowest price is generally the order of the day, and they also know that proper competent men are not placed in charge of such work, and oftener than not the tender was so low, that some method or other is resorted to so as to enable the sanitary or heating engineer to come out without a loss. What is really wanted is, better laws regarding the heating and ventilating, then competent men to inspect the work, and proper plans drawn for such work. These, too, should be enforced to the letter, and it should be understood that any shortage or irregularities if proved should be considered a criminal matter, and not to be gotten over with a fine. Such drastic measures may seem harsh, but it would rid the craft of so many ne-er-do-wells, and poor mechanics who have never learned the trade properly. It would make all parties live up to a proper level which would give the public a square deal as well as allow those who wish to do right, but are prevented by the system that prevails, to do so.

A Poor System.

Referring to the system which prevails re the submitting of tenders on work:

First the architects call upon sanitary and heating engineers for tenders. Often on a job of about \$1,000 there are as ten tenders submitted. Oft-times it will take the best part of two days to properly figure the price out and prepare proper plans for same. Then only one man can get the work. What are the results? Nine men have spent their time for nothing, and worse still, often their business has suffered considerably and all to no purpose. Such is not the case with an architect. He charges for his plans, and gets the other trades prices in for nothing. It is an easy estimate when we state that on an average 5 per cent. of the cost of a job has been lost to those who tendered on such work through an architect's office. That is adding them all together, both the successful and unsuccessful tenderers.

A Remedy Needed.

In the first place there should be some federal control to deal with sanitary heating and ventilating.

There should be practical inspectors appointed to supervise work of this nature, who are in no way interested in the work. No architect should be allowed to pass work, when he knows very little about it. Then when tenders are called for and plans prepared, they should be paid for if not accepted, but should remain the property of the owner.

Then if perchance a certain plan was approved of, but the price was thought to be too high, another party could be asked for a price as a test, on the favored plan. Some time ago the writer asked one of the most progressive sanitary and heating engineers in Canada the following question:—

"What portion of your overhead charges are against the department which takes all quantities off and sends in tenders on work, which is never got by your firm?" and the reply was, "Over \$5,000." A matter of two per cent. on their whole turnover.

Now why should this be? A building contractor not very long ago stated that he could earn more money working by the day than his business paid him.

(Continued on page 25.)

"Shop Economics"—A Talk With Boss, Journeyman and Helper

Showing Where Savings Could be Made, Where the Boss Would Save, Journeyman Earn, and Helper Learn, by Adopting the Right Method at the Right Time.

FROM time to time "Sanitary Engineer" has been urging upon its readers the necessity of making plans of each job before starting. This, of course only referred to installations of some size which would warrant such a course. However, this week we had our attention drawn to two installations, viz.: One of a steam heating system with nearly 4,000 feet of radiation and the other a small hot water system to a garage. With one radiator, the latter was an auxiliary system and heated by inserting a heater in a hot water furnace.

The steam system was fairly well installed, though it could be seen that no plan was first drawn of the job, or there would have been less fittings used, for instance, measurements must have been taken at random, and in several cases where a riser was taken off, more elbows were used than necessary.

In many cases we are aware that a larger number appears to have been used, and are required to allow for expansion, etc., but in this case such was not necessary to the extent used, and the habit of sketching out a plan for the whole installation and along with the plan a few detail sketches of branches would be of great assistance, when a greater number is used, it means that circulation is so much retarded. More threads to make, more nipples used, and in all a much inferior job at a higher cost.

Conserve the Fittings.

At this date these fittings, while not very costly, mean a lot of money in the aggregate, and it is surprising to note the difference when looking over two installations of almost identically the same layout, thus we would urge in no small way the necessity of thoroughly looking over the location of a job, the way one is intending to run a line of pipes or risers and in every case bear in mind to conserve every fitting possible. This can only be done by making a plan of the installation before starting.

Another good feature in this method is this, it is easier to make up a bill of quantities from a plan, and thus making it less liable to miss out any fitting or other incidental required. Then the habit of allowing a certain time on the job would be more accurately estimated than by mere guess work. In passing, we are sure there is too much guess work or shall we say "rule of thumb"

methods adopted by those of our craft, particularly in some work.

The second installation we referred to as the hot water system.

Here was a small job installed without any regard being taken as to number of fittings. It was done fairly neatly, but the fitter seemed to have the idea that every line of pipe should be square with the building, the results were, on the flow there were three elbows too many, and on the return five too many. Not only so, but no thought was given to the pitch of the flow and return pipe. It should, however, be stated that the system was fed from the city mains with an average pressure of 30 lbs. per sq. inch. Some have the idea that when such a pressure is on the system the circulation is so greatly increased that it is not necessary to adhere to the general practice of flows and returns being run up and down, from and to the boiler, but we feel sure such is not correct. No

doubt there are systems where heat generators are installed in which the same amount of pitch is not required, but even they give better results when a certain amount is given. There are cases where a riser or branch is either set level or trapped a little so as to avoid the robbing of heat from a certain radiator on that line and so on. But here was a case where we would estimate the piping was at least 35 feet long, and both were actually trapped, too many fittings used and did not circulate, and when asked if the trapping would not retard circulation, replied, "That on account of it being a pressure job it did not matter how the piping was run." We feel sure such an answer if given honestly is a delusion, and should be changed.

In conclusion let us urge our readers to make a sketch of the job, however simple, and in a small shop, the proper number of fittings handed out to do the job.

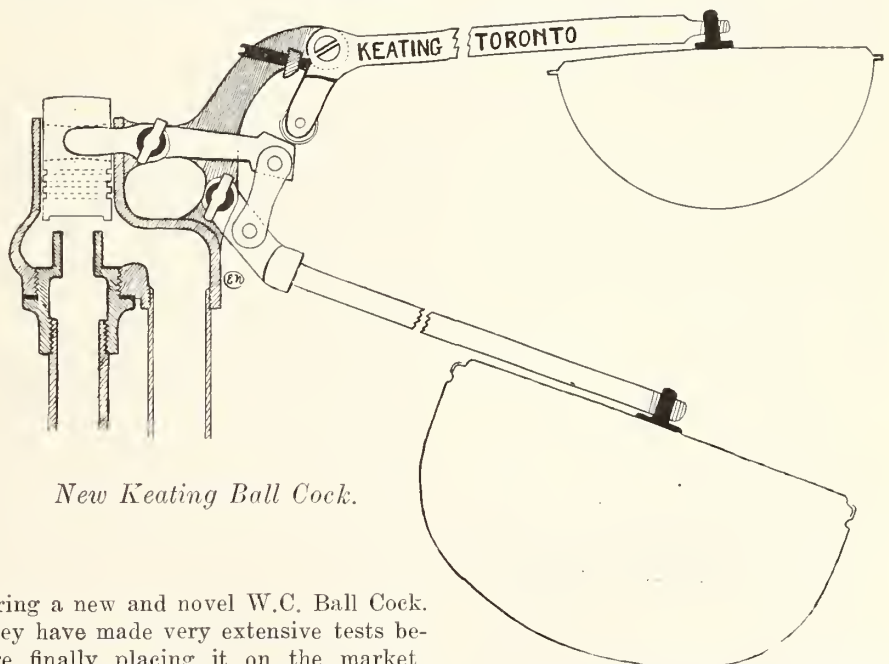
New Sanitary and Heating Goods

NEW BALL COCK.

The Keating Brass Works, of Macdonell Ave., Toronto, are now manufac-

positive in action and carries with it their usual guarantee.

Those wishing to know more about



New Keating Ball Cock.

turing a new and novel W.C. Ball Cock. They have made very extensive tests before finally placing it on the market. We are told the original one has actually been in operation for several years. They claim it is substantially made,

this new article will be furnished with full particulars by writing to The Wm. Keating Brass Works, 266 Macdonell

Analysis of Canadian Sanitary Engineering Bylaws

In This Issue We Are Again Taking up By-law No. 1531, Now in Force in the City of Calgary—Comments on This By-law Will be Concluded in Our Next Issue.

IN our last issue we commented upon several clauses of this by-law, and ended the article with comments dealing with clause 21.

Clause 22.

This clause need not be commented upon as it is general though very specific, and defines the different kind and styles of fittings and pipe which will be allowed for soil, waste and vent lines.

Clauses 23 and 24.

These clauses define the thickness which all piping shall be whether wrought iron, steel or brass, and give the gauges, or thickness and weight per foot which such pipe shall be.

The second paragraph in clause 24 deals with methods which must be applied when making connections between the different pipes, traps, etc., and reads as follows:

Connections on brass pipe and between brass pipe and traps on iron pipe must not be made with slip joints, unless connection is made with lead composition ring to countersunk bearing. Threaded connections on brass pipes must be of at least 16 gauge tubing.

Such methods are very commendable on account of their being specific, one thing lacking in most of our by-laws and which often leads to a great deal of equivocating is, that some of the clauses are too general and are in themselves really meaningless. And, while speaking in this strain we may state that on the whole this set of by-laws we are now commenting upon, embody some of the most novel features which have come before our notice. For instance we will conclude clause 24, by reproducing the last two paragraphs which deal with the weight of brass ferrules, the sizes and length of same, viz.:

Brass ferrules must be best quality, extra heavy cast brass, not less than (4) four inches long, and (2½) two and one-quarter, (3¼) three and one-quarter, and (4¼) four and one-quarter inches in diameter, and not less than the following weights:—

Diameter.	Weights.
2½ inches	1 lb. 0 ozs.
3½ inches	1 lb. 12 ozs.
4½ inches	2 lbs. 8 ozs.

One and one-half inch ferrules not permitted.

Lead waste pipe joined to brass ferrules or solder nipples must pass inside.

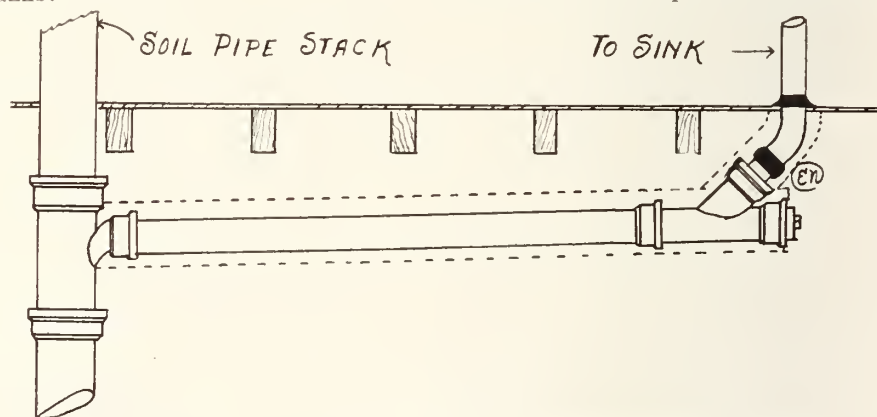
Clause 25.

Solder nipples must be heavy cast brass, and of the following weight:—

Diameter.	Weight.
1½ inches	0 lb. 8 ozs.
2 inches	0 lb. 14 ozs.
2½ inches	1 lb. 6 ozs.
3 inches	2 lbs. 0 ozs.
4 inches	3 lbs. 8 ozs.

A Suggestion.

When such clauses are embodied in a by-law, sanitary engineers in that city or town will do well if they would have a few words such as these on their order blanks:



Dotted lines show how sink waste should be protected when in cold location.

The goods mentioned below are ordered and bought with the understanding that they comply with this (city or town) sanitary by-laws.

No doubt much trouble would be overcome for all concerned, there would be less price cutting, and the sanitary engineer would have no need to take the trouble to weigh each and every nipple or ferrule, and we are sure manufacturers are as a whole only too pleased to see that their goods are right weight, but we have known where light weight goods have been sold by persons who did not adhere to the right practices in such matters, thus making it harder for those who were desirous to do the square thing.

Clause 26.

The use of lead pipe is restricted to the short branches of the soil and waste pipes, bends and traps, and roof connections inside leaders.

This clause is all right as far as it goes, but in our opinion scarcely goes far enough into the subject, for instance, what would be termed a short branch and under what condition? Let us suppose we are roughing in a branch for the waste of a bath say five (5) feet long, including traps which would be under the floor, we would think no objection could be made to that. But on the other hand, if a sink was being roughed in for an S trap to the floor and from the floor to the stack was five (5) feet, would that be termed a short branch, under this clause? We hope not, and though we do not wish to be presumptuous, we feel an amendment in such a clause under those conditions would be a good move. In Fig. 1 we show what in our opinion should be done,

even if the branch is as short as two (2) feet for a sink, and under the same condition, the very nature of the material which is poured down the sink requires different measures to be enforced when dealing with the sink waste pipes, much more so than when dealing with bath room waste. See Fig. 2.

The writer was called in several times to clear a sink waste which was continually being blocked up by the occupants of the house throwing every kind of waste down the sink. This waste pipe was only 4 feet long, but the basement was very cold and the amount of grease that did flow down became chilled, even after a new waste pipe of iron was put in still the same trouble prevailed.

So it was decided to cover the waste pipe with asbestos pipe covering which eventually solved the problem. Thus proving as far as pipe covering is con-

cerned, that what will keep in the heat, will also keep out the cold.

Clause 27.

This clause is fairly general, and deals with the kind of joints which will be and will not be allowed, and is a good clause as it sets at rest any any misunderstanding on the part of the mechanic, viz:—

All connections between lead pipes, and between lead and brass pipes must be made by means of full wiped joints.

No cup, wiped cup, or overcast joint will be allowed.

Clause 28.

Deals with lead traps, lead bends and sheet lead, all which must be 6-lb. lead, and also gives tables of weight which lead waste pipe must be to comply with the by-law, viz.:

Diameter.	Weight per lineal foot
1¼ inches	2 pounds
1½ inches	2½ pounds
2 inches	3½ pounds
3 inches	6 pounds
4 inches	8 pounds

The wording of this clause reads as follows:—

“All lead traps and bends must be of drawn lead, and the same weights of thickness as their corresponding pipe branches.

Sheet lead used for roof flashings must be six-pound lead, and must extend not less than six inches each direction from pipe.

Clause 29.

This clause is made up of the definition of terms used in some of the following clauses which are general in detail, most of which are embodied in other by-laws.

Clauses 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, are all of a general nature and deal with:—

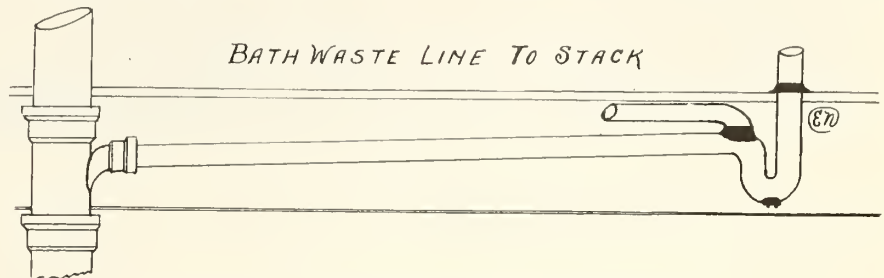
SEPARATE CONNECTIONS—PRIVATE SEWER CONNECTIONS—FEE FOR EACH INSPECTION—LICENSE OF DRAIN LAYERS—BARRIERS—BACKFILLING—INJURIOUS WASTE—OLD CONNECTIONS—DISTANCE FROM BUILDING—AND SEWER CONNECTION TO STREET LIMIT.

Clause 41.

This clause is of more importance, and deals with floor washouts in cellars, stables, etc., and reads as follows:—

Floor washouts in cellars will only be permitted when it can be shown to the satisfaction of the plumbing inspector that their use is absolutely necessary and arrangements made to maintain a permanent water-seal in the trap.

These traps must be placed not more than (5) five feet nor less than (2) two feet from the main drain,



No need for protection as in case of sink waste.

and have not less than a (4) four-inch water seal, which need not be vented, and have cleanout fitting caulked in opening.

Very little can be said about this clause, as it is very clear and rigid. It is very commendable in every way, for the simple reason that in many cities these cellar drain traps are being inserted without any regard as to the permanency of the water seal. Often it has been known that an odor has been complained of, which has been found to come from one of these traps which, on account of there being no provision made to retain the seal, they have been found dry.

While we feel sure such a trap should be installed in every cellar, so as to take care of any overflow or leaks which may arise in the cellar, there should be reasonable provisions made. For instance, the refrigerator waste could be conducted to one of these traps, as shown, which would take care of the seal in summer time, and in winter the seal could be protected by the occupants being instructed what to do to prevent sewage odor from entering into the house. This could be done easily on account of the constant attention to the furnace.

In our next issue we will conclude this by-law, which has nearly fifty more clauses, some of which are general, while others are equally if not more interesting than those we have already mentioned in previous issues.

PROGRESSIVE FIRM OF SANITARY HEATING AND VENTILATING ENGINEERS IN REGINA.

(Continued from page 17)

No doubt the experience they have acquired makes them strong advocates of the motor truck and it is a surprise to us that more are not used by sanitary engineers. Though we know of

firms in our line who are using as many as seven of these vehicles.

This firm stated when asked how they like their motor truck:

“We have had the motor truck in operation since May first, 1913, during which time it has covered over 6,000 miles, and the total expense, including gasoline, tires, and all repairs, has only amounted to \$320.00.

“Previous to our purchasing the truck, our draying account used to amount on an average to \$100 per month, and you must understand that these figures do not include hauling of freight to and from the depot.

“But if we figured the time and money we have saved by using the truck in getting round to our different jobs, etc., our expenses, viz., \$320, would be considerably diminished.”

DON'T SAY IT.

From this good dope don't run away,
'Twill save you trouble day by day,
'Twill make you smile and raise your pay,

'Twill help to make the old world gay;
When you ain't got a thing to say—

Don't say it.

Domestic Hot Water Supply Problems

A Series of Articles Dealing With the Problem of Hot Water Supplies, Range Boiler Connections, in Various Forms, and Methods Adopted as a Means of Heating Water Under Various Conditions.

OF all subjects which the sanitary and heating engineer is confronted with these days the most frequent are found to be those which are involved in the different method of connecting range boilers with water fronts and backs, heaters, heaters and water fronts. Several water fronts, and in many cases two boilers to one water front, or vice-versa. In fact there are such varying conditions that it would

neymen often "up against it" but lots of the good old "Wiseacres" who have installed numerous "freak" systems which have given splendid results, and the reason could not be worked out by any principle and many's the time the same kind of job has been installed under identically the same condition, and which has absolutely refused to work.

Hence in this series of articles we will deal largely with the most popular connections, which have come before the notice of the writer and which too have given satisfaction. We will also show connections which for apparently no reason would not work and the alterations which have been made when satisfactory results have followed.

First we will discuss the general principle which is the cause of circulation, without which, the system of either hot water supplies, or hot water heating systems would be a thing unknown. And, before going further, let us here state that no highly technical phraseology will be indulged in, thus enabling those with a limited amount of education to be benefited by these series on this most interesting subject.

Circulation as known to the sanitary and heating engineer is a term used when discussing heating problems as applying to either water or steam. But in this instance it applies only to the circulating of water.

Water is at 40 degrees Fah. at its heaviest, bulk for bulk. For instance, if we take a small vessel and fill it to the brim then place it over some flame or fire. We would notice it overflow, simply because as it becomes heated, the volume becomes greater, though the weight is the same. Furthermore, to a certain extent the same conditions prevail if we place the vessel outside when the weather is several degrees below freezing point. Were we to watch for the results we would actually observe the change taking place, viz., the expanding of the water, yet as we stated before, the same weight of water would be there, though the cubic area would be increased. Thus we prove that water at 40 degrees Fah. is at its maximum density.

So as to endeavor to show our readers a simple form of action which takes place and which is termed circulation. We will ask them to look at Fig. A. Here is shown a glass tube which any student may make by getting a straight piece and applying the centre to some

flame and bending carefully place a quantity of water in it and hold over a lamp or even candle, and it will be seen that the column of water over the flame will be higher than the other. Then observe Fig. B which is exactly the same except that the two columns of water have been made to form a circuit, and until the flame is applied no movement will take place. But let us apply the heat and see what takes place. First we

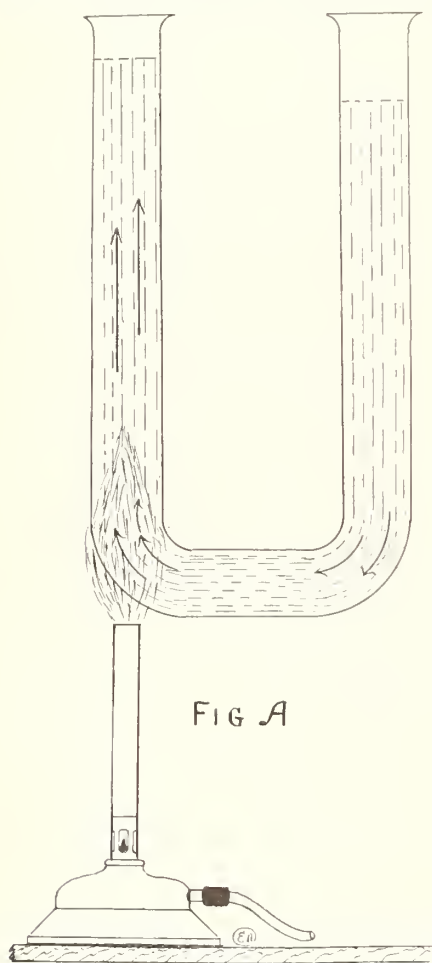


FIG A

Showing action of water when heat is applied to one column.

almost fill a book in trying to apply a proper name to such connections, expect that they are all hot water connections or circulating pipes.

This subject seems never to be exhausted, and every day almost "Sanitary engineer" is confronted with questions why this or the other connection does not work, and it must be stated that it is next to impossible to define actually the cause when the actual condition is not always known.

Not only are the new or young jour-

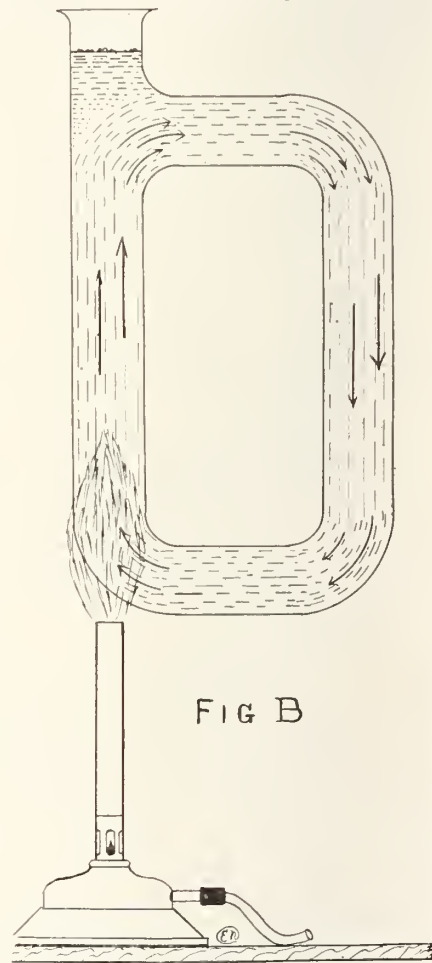


FIG B

Showing circulation which takes place when a circuit is formed.

established a circuit, next we apply heat. Then we alter the density of one column of water thus causing the circuit of water to move, or circulate. Hence we have established circulation.

Having shown in simple form the principles of circulation, we must always keep in mind that any obstacle which we place on the line column or body of water which we wish to circulate retards such circulation. Therefore when planning a hot water supply, we must keep

(Continued on page 24.)



A few of the many fixtures recently installed in the offices of North American Life Insurance Co., Toronto, along with A. F. Passmore, who installed this equipment.

Sanitary Engineers Should Individualize Their Accomplishments

*An Argument in Favor of Placing a Name on Every Installation
However Small—Thus Creating a Personal Reputation.*

The curse of price-cutting seems to be felt throughout the whole business world. Speaking to one of the craft some time ago, he stated, "It is no use of anyone saying they do not cut prices, 'everybody's doing it.' I do it to protect my trade. The other fellow does it because he is told I am doing it, and so on. New men with little experience take on work at too low a figure, which is a proof of the lack of experience."

The public are out to get the cheapest job, and think that low prices are generally cheapest. It has, however, been proved otherwise, and to-day the public are beginning to see the folly of giving their work to the lowest tenderer.

Don't Make the Work Cheap to Meet Low Prices.

There has somehow crept in an element of cheapness, or shall we say low-priced work, in this sanitary and heating business which is the reason for this public awakening. Hence we feel that now is the time to make one's work speak for itself, to give results. Many an installation has been made to meet the price, and the reputation of those who have met the price is now at stake. Many a customer is coming back at these men and saying: "Well, why did you not tell me I was wasting money in having it done in such a way? Therefore, let us urge our readers not to cut prices, or even make the job cheap enough to meet the price.

In these days of real estate activities property changes hands often, and when a certain installation has been doing good service for a reasonable period, those who hold property are able to note who

installed the work, if the sanitary or heating engineer has individualized his work by putting a name plate on it. They are to-day reasonably cheap and mean a perpetual advertisement. Particularly so in public institutions.

The business of A. F. Passmore, situated on Yonge Street, Toronto, deserves great credit in the installation of a recent date. Mr. Passmore was the successful contractor in remodelling the sanitary and heating engineering for the North American Life Insurance Co., King Street, Toronto. Each floor of these

room or lavatory. We have pleasure in showing also a cut of the plate he uses. It is quite substantial, being made of heavy cast brass with a dull ground-work and polished letters which give these plates a very high finish. The writer was speaking to another craftsman recently who had always made a point of putting a plate on all fixtures or on the wall near it. He stated that although he had been out of business for several years, people were constantly ringing him up, on account of having seen his plate on some work which had



Solid brass name plate 5 inches long.

premises was equipped with the finest and most up to date sanitary fixtures that money could buy, compatible with good lasting qualities. The cuts shown herewith show one or two of the arrangements, all of which are of solid porcelain, with heavy brass goods, nickel plated. We have also shown not only "Passmore's work" which, of course, is the results of his work, but have also shown him when on pleasure bent, "and the results."

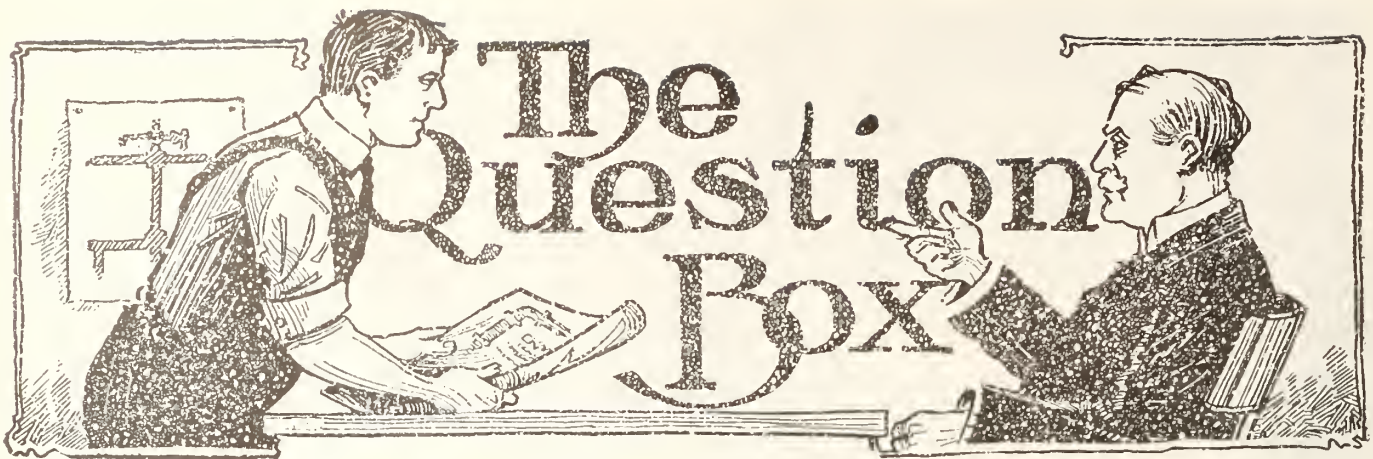
Mr. Passmore is an enthusiastic craftsman and believes in placing a name plate in a conspicuous place in every bath

been giving satisfaction for several years.

Hence, during the New Year, which we have so recently entered upon, let us individualize our work, be proud of it, and rather than cut prices, lose the work. A low-priced job never gives satisfaction either to the sanitary engineer or the customer.



Remember you may be an employer some day; and try to perform your duties as you would have them performed by clerks under you.



Subscribers Are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks Are Also Invited.

BACK-VENTING OF W.C.

Referring to a question sent in along with several others by one of our readers in British Columbia, signed G. W. C., Grand Forks, in which we were asked to show how a battery of W.C. should be back-vented, by reading the article entitled: "Plans of work recently installed in a Canadian public school," he will see how we have treated his question, seeing that it has bearing on the article we had to publish we have not repeated it under this section.—Editor.

HOW TO DEVELOP A 5-PIECE ELBOW.

Editor, Sanitary Engineer.—"Will you please publish at an early date a simple method, showing how to develop a five piece (5) elbow."

Yours, etc.,

Enquirer.

As requested by enquirer, we have pleasure in showing how a 5-piece elbow may be developed. We may state that an offset may be made of different positions by leaving the joints a little loose until the desired offset has been obtained. The joints should be backed with a little solder.—Editor.

For Pattern Plate, See Page 28.

FIG. 1.—We will suppose a 10-in. elbow is to be developed. Take the compasses and make circle 10 inches in diameter; then erect a vertical line with J as centre. Then erect another line as shown. A. B. C. making the line solid from B to C. Then determine what length of throat is desired, making from A to be the length. Place compasses at A and draw a quarter circle from C to H, thus giving the outside circle of elbow. Complete profile by again placing compasses at A and B and drawing the inner portion from B to I.

We will now measure off the quarter circle into 5 sections, which should be done as follows. Take compasses and divide off outer portion of elbow into 8 sections as shown a. b. c. d. e. f. g. between C. and H. Having done this, place the straight edge and mark off as shown A G, A F, A E, and A D.

Having completed the profile we will now develop the pattern by marking off in equal portions the circle J as shown, viz.: 1. 2. 3. 4. 5. 6. 7. Then stretch out these to section line D and A.

This being done, we will turn to Fig. 2. Draw line I. I. and take the stretch out developed at J in Fig. 1 and mark off thirteen points, from these erect thirteen vertical lines as shown. Having done this, proceed by marking off the amount of material required by measuring points at inner and outer circle in Fig. 1, with the compass and transferring same on vertical lines I B, I B. Then proceed to develop the curve 5 by placing the compasses first at 7 h 6 x.5 x .4 x .3 x.2 x.1 D and transferring same to line I I on Fig. 2.

When this has been done mark off as shown and cut first piece, then by turning this section No. 5 over and allowing material for throat section, No. 4 will be complete following same rule until No. 3, 2, and 1 are cut out. It is desired to make section 1 a shade smaller to allow entering the big end of another elbow or length of pipe. All that is necessary is to cut about $\frac{1}{8}$ inch from each edge to nothing at first joint marked h. Any length or size of elbow may be made by following this rule throughout. Not only may a five-piece elbow be developed in this way but almost any number of sections, by simply marking off a profile as shown in Fig. 1, and dividing the outer are into the required number always taking care to make the sections at each end of the elbow exact-

ly half the size of the other sections, but counting them as full sections. For instance, it will be seen that Fig. 1 from C to H is divided into 8 sections, viz.: a b c d e f g, then re-divided into 3 larger sections, 2, 3, 4, and 2, small sections 1 and 5. Thus by studying this method any piece elbow may be developed in the same way.—Editor.

DOMESTIC HOT WATER SUPPLY PROBLEMS.

(Continued from page 22.)

in mind to refrain from causing any friction on that line or column and if conditions arise which need the use of too many turns or bends, be sure and always have them as long as possible and on an upward flow, never less than 1 in. in 5 ft. and more when possible that is for hot water supply systems. Further, all pipes should be reamed and free from burr's, fewest possible elbows being used. Shortest length of pipes too, should be used. How many heating engineers have been called upon to place a heater in a furnace and for the sake of neatness have run all the pipes square with the plan of the building which in many cases meant from 6 to 20 feet more pipe according to the position of the heater and boiler above.

The writer has known some of our very best mechanics to instal such jobs, which have of course worked all right, but have not given the results that a shorter pipe line and fewer elbows would have given. While we require to instal these systems neatly, we must not jeopardize results by so doing, and need not if we take a little more care in laying out the work. Almost every installation has its own condition to be considered though, at the same time all such systems, as we stated before are governed by general principles.

GOSSIP OF THE TRADE

PLUMBERS AND STEAMFITTERS HOLD ENJOYABLE SMOKER.

The annual smoker of the Journeymen Plumbers and Steamfitters, Local 264, was held in the Labor Temple on Monday last, the chair being taken by Alexander Rankin, when over fifty were present, and a most enjoyable evening was spent. Following is the program: Overture, "Triumphant Banner," D. Simpson; violin solo, Scotch Aria, G. S. Scott; clog dance, Wm. Nuttall; song, "Rocked in the Cradle of the Deep," Fred Kidman; march, "True Fest," R. D. Simpson; violin solo, Scotch Airs, G. S. Scott; a short spiel by A. Chesser; song, "How Do You Do," A. McGregor; humorous reading, "The Violin," J. J. McGrath; song, "Too Hard," J. Povey; dance, Wm. Nuttall, sr.; song, "I Happened to be There," A. Chesser.

Enjoyable short speeches were given by several of the employers, including A. Brown, J. Campbell, H. Parnell and G. Geizer.

Song, "The Song of Ages," G. S. Scott; encore, "O' All the Airts"; song, "The Song That Reached My Heart," F. Kidman; song, "The Midnight Sun," A. Chesser; encore, "In the Pale Moonlight"; song, "Comrades," A. McGregor; violin solo, selected, G. S. Scott; encore by G. S. Scott; song, "The Stormy Main," A. Chesser; encore, "I'm the Safest o' the Family," A. Chesser; song, "Genevieve," Fred Kidman.

The toast of "The Visitors" was responded to by Wm. Snellgrove. The piano was ably presided over by R. D. Simpson. The committee responsible for the arrangements were W. J. Robinson, J. J. McGrath and H. C. Nixon.

MAN'S TERRIBLE INJURIES.

Ottawa.—G. Currie, a steamfitter, sustained terrible injuries while testing a hot water boiler at Westboro, near here. The boiler exploded, one piece of the metal tearing away his right arm and another fracturing his jaw. It is said he will recover.

Regina.—Messrs. Morrison & Blair, tinsmiths and sheet metal works, have

recently dissolved partnership. Jno. Blair will conduct the business.

Mr. McKinley, of the McKinley Hardware Co., Parry Sound, was a visitor in Toronto this week.

J. E. Mosley, hardware merchant, Huntsville, Ont., was a visitor in Toronto this week. He reports trade as being very good in his district, and is very optimistic regarding the outlook for spring business.

THE TORONTO SCHOOL TENDER
SYSTEM A FARCE.

(Continued from page 18.)

A sanitary engineer not long ago made another statement similar, and that was that if he could charge \$2 as an average on all work he tendered on over \$75, he would soon make good but the way things were going he was losing money.

GOOD WORK BEING DONE BY MEMBERS OF THE ROYAL
SANITARY INSTITUTE.

Petition Will Be Presented to the City Council to Have Inspector Appointed.

Sherbrooke.—Last evening a representative meeting of sanitary engineers of the city was held in the Magog House to consider the question of petitioning the City Council for an inspection of all work connecting with sewers.

Mr. Hilder Daw, Mem. Royal San. Inst., showed the gathering the methods whereby bacteriologists can detect the presence of gas, etc., collect the germs therein and by subcultures are enabled to classify them and ascertain their disease producing capacities.

Mr. Hilder Daw pointed out that it was useless for the Civic Authorities to put their sewers in a sound condition if the plumbers allowed sewer gases access to the homes, causing intestinal and throat illnesses.

Mrs. S. A. Jones, a member of the Royal Sanitary Institute, made a forceful appeal and outlined the regulations governing all health controlled communities.

It was unanimously decided to secure the signatures of the responsible and established plumbers to a memorial to the Council, requesting the inspection of sewer connections, and the meeting was adjourned until the first Monday after the coming Municipal elections.

Prominent Sanitary Engineers on Board of Health.

London.—At the first meeting of the City Council a number of appointments will be made for various bodies.

It is expected that Dr. F. L. Burdon, W. H. Abbott and Jas. R. Haslett will be re-elected as members of the Board of Health. They have done signal service during the year, and will be chosen without opposition.

It may be stated that J. R. Haslet is a prominent sanitary and heating engineer doing business in London. He is also the instructor of sanitary and heating engineering at the London technical school, which is doing great work in that fair city. Mr. Haslett devotes considerable time to this work, which is a great credit to him.

to prepare an educational campaign, showing the public in a straight-forward way that, better laws are needed controlling those who instal such work. Those who prepare plans and tender on work and those who inspect and pass such work before it is finally taken over by the owners.

When works of a public nature, such as our schools and colleges, and other institutions require such work done there should be men employed who have something to lose, some responsible firm who do the work, or some firm of consulting engineers who are experts in that particular line.

Then, and then only, will the public get a square deal, and the sanitary and heating engineer get his due.

Problems in Sheet Metal Work

Editor, Sanitary Engineer:—Kindly inform me through the columns of your paper how to draw patterns for a three and four-piece elbow.

"Subscriber," Hamilton, Ont.

For the benefit of "Subscriber" and other readers interested in problems for the sheet metal worker we are supplying the information requested above along with patterns for four sizes of elbows, viz., 2, 3, 4 and 5 inches.

We will develop the pattern for a two-piece elbow, as shown in problem 1, plate 11.

We will say the elbow is for a 3-inch pipe. The size of pipe, however, makes no difference, as the principles involved are the same, whatever size is being developed, either round or elliptical.

Draw a circle 3 in. diameter. This represents the plan. See Fig. 1. Above the plan, and in line with it draw the elevation, Fig. 2, which is really an outline drawing of the two-piece or mitre elbow, showing how it is constructed. It also shows that it is a 90 degree two-piece elbow.

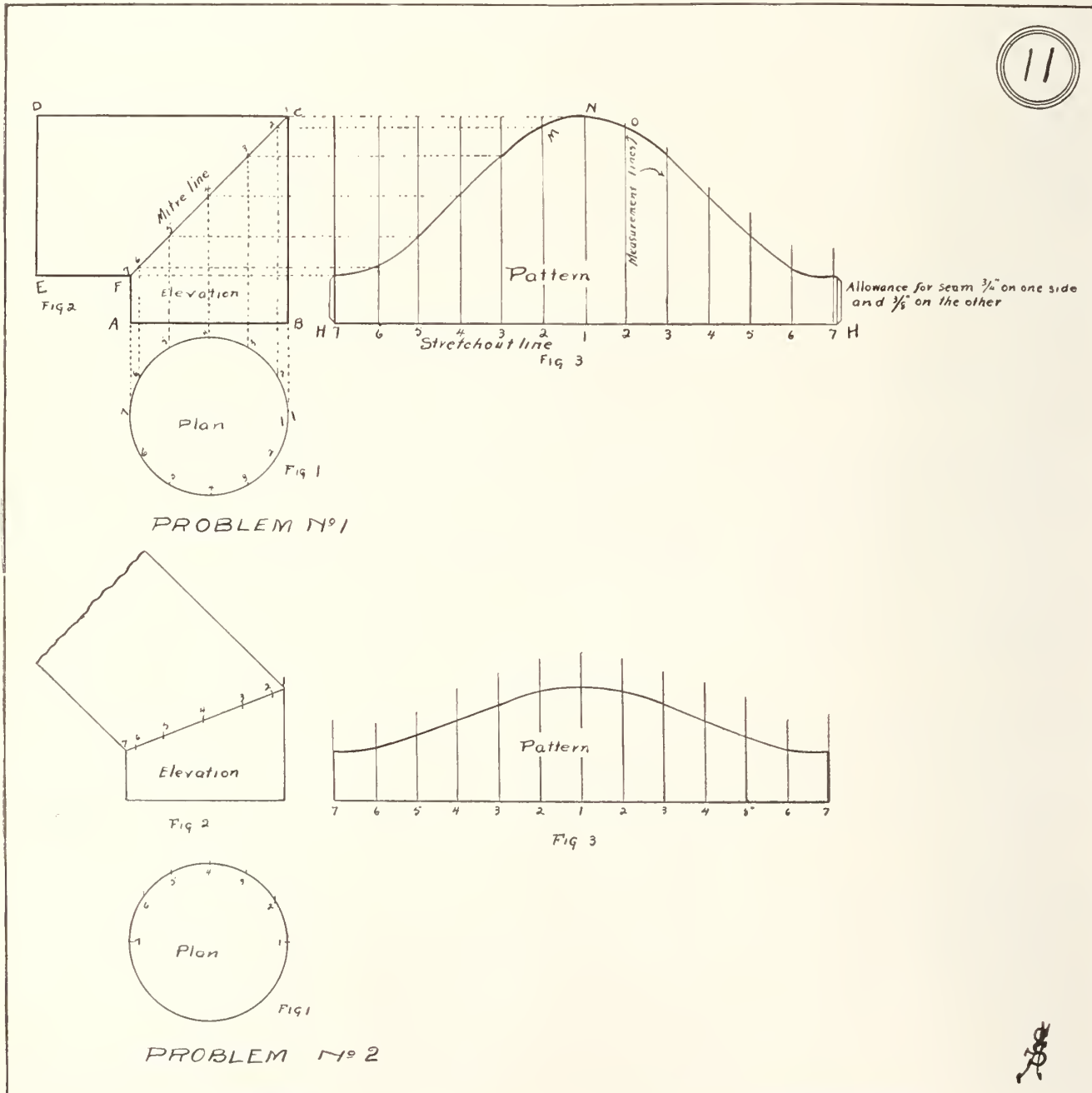
The spaces A B and D E must be the

same width as the diameter of the circle, viz., 3 inches.

Draw the line F C, which is the mitre line or joint, off to one side, and in line with A B draw a line H H, which represents the stretch-out line.

Now with the dividers step off one-half of the plan, Fig. 1, into numbers of equal spaces (in this case 6) and number each point 1, 2, 3, 4, etc., as shown.

It is only necessary to space off one-half of the circle, as both sides of the elbow mitre are the same.



Now transfer the spaces on the plan to the stretch-out line, H H. Transfer twice the number of spaces stepped off, or complete girth of the circle, and number these spaces same as on the plan.

Start with No. 1 in the centre and number each way. Draw the usual measurement line through each number.

Now return to Fig. 1, draw a dotted line from 7 on the plan to F on the elevation, or else place the T square parallel to the line B C, and carry each point on the plan to the mitre line, F C.

Then place the T square parallel to D C, and carry these points out to the corresponding measurement lines and make a mark through each. A line traced through these points gives the desired pattern.

Problem Two.

Draw a square mitre for a 2 in. and 4 in. pipe. Problem 2 is another two-piece mitre, the only difference being that the elbow is at an angle of 45 degrees, instead of being at right angles. It will be noticed here that we do not draw the dotted lines from one point to another. We merely place the side of the T square against the number, and make a small stroke through the point we wish to cut, thereby saving time and making the work simpler.

Draw two patterns for elbows of different angles.

Let us now take problem 3, plate 12. This is a 3-piece elbow.

First draw the plan, Fig. 1; then the elevation, Fig. 2. The pattern for the parts A and B are developed the same

as explained in problem 1 and 2. So they need no further explanation.

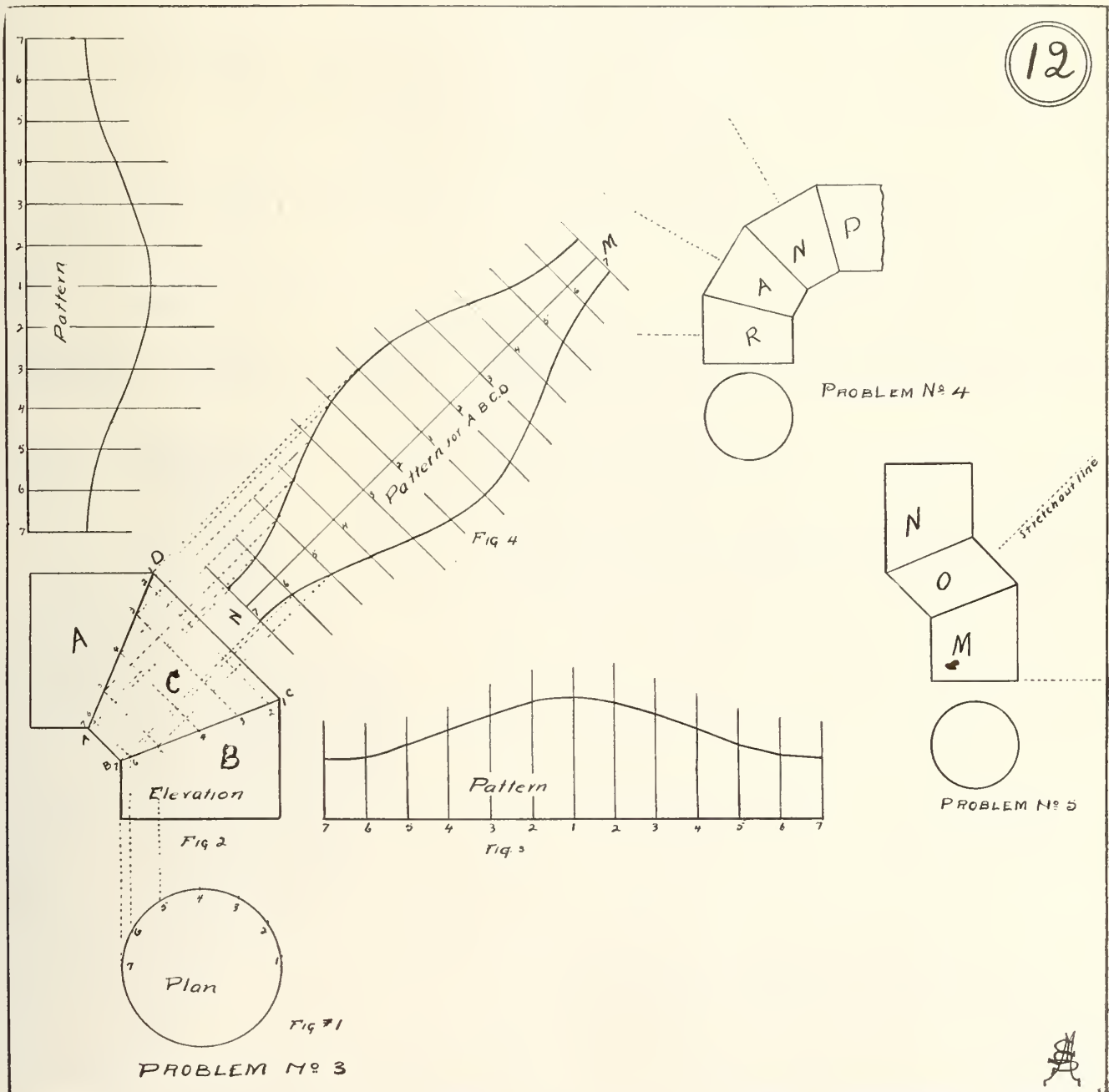
What we want to know now is how to develop the pattern for the gore piece B.

Having drawn the plan and elevation, divide the plan into equal number of spaces and number each.

Carry lines to the mitre line B C and mitre line A D by drawing lines parallel to D C. Now draw the stretch-out line N M at right angles to the line D C.

Transfer the spaces from the plan to this line. Number same and draw the usual measurement lines.

Now place the T square or side of the triangle against the T square so that its edge will run parallel to the line N M, and carry each one of the points from the mitre lines A D and B C out to the



measurement lines having the corresponding number. A line traced through these points gives the desired pattern.

Draw a pattern for a three-piece elbow 4 inches in diameter.

Problem 4 shows a four-piece elbow. The end pieces R and D are developed the same as explained for problems 1 and 2.

The gore pieces A and N, as explained for problem 3, draw a four-piece elbow for a 3-inch pipe.

A very easy way to make an offset is to leave the seams of A and N., viz., the centre joint very loose, and by twisting these almost any desired offset can be got. When the desired offset has been fitted, mark the position and pene down so as to make it tight in the right direction.



WHO MANUFACTURES BEVEL GLASS?

Editor Sanitary Engineer.—Can you please furnish us with the names of the manufacturers of bevel glass? Thanking you in anticipation, we are, yours truly,

Classic Sanitary and Heating Co.,
Stratford.

Replying to our readers, the Classic Sanitary and Heating Co., Stratford, we may state that this commodity may be got from either the Toronto Plate Glass Importers Co., Toronto, or the Consolidated Plate Glass Co., Toronto, both of which will be only too pleased to cater to your requirements.—Editor.



Editor Sanitary Engineer:

Dear Sir,—I am sending you enclosed the sketch of an expansion tank I saw the other day, and I would be glad if you could tell me any reason why it should have been so fitted. When we got

there the system was full of steam, all the water out of the radiators and boiler. It had evidently boiled out.

Yours truly,

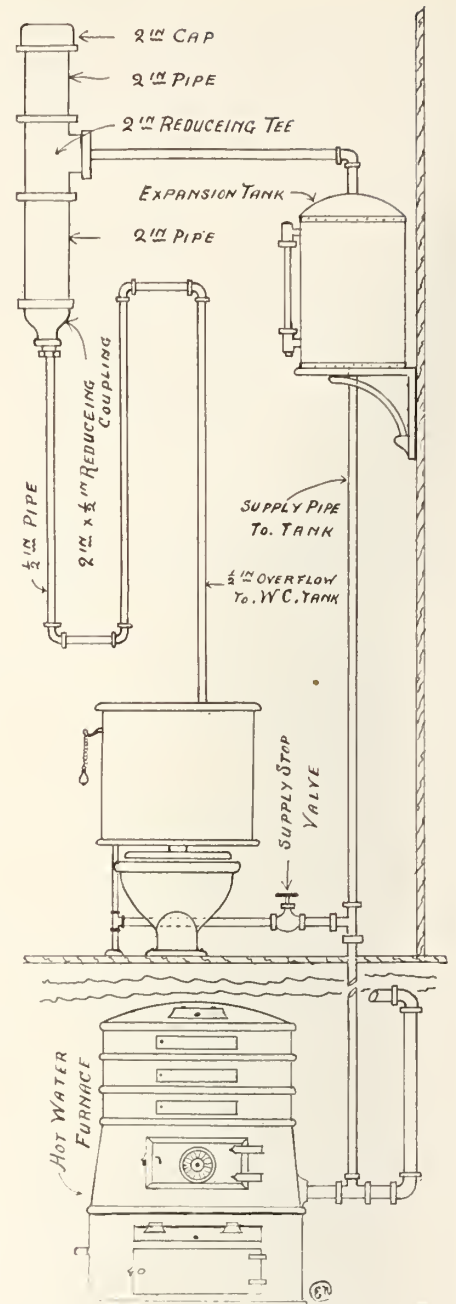
A. D. H.

In replying to our correspondent A. D. H., we may frankly state that it is beyond our conception to attempt to give a reason for such an installation. The man who put in that job should be brought before a magistrate and tried for fraud. Such men are a menace to the public. Such an installation is not only mechanically wrong, but is also dangerous. However, Sanitary Engineer has repeatedly voiced its opinion that matters of heating and ventilation should be under some authoritative board. Plans should be submitted to that board, giving amount of radiation, size of chimney and furnace, etc., thus safeguarding the public in a proper way. We in Toronto have had some experience by the way the Board of Education have managed such matters. The same tactics are being practiced upon the public in the work done at their homes. Architects make out faulty specifications and kissing goes by favor. We are producing our correspondent's drawing and would like some of our readers to voice their opinion on the job, seeing it is beyond our abilities to solve. — Editor.

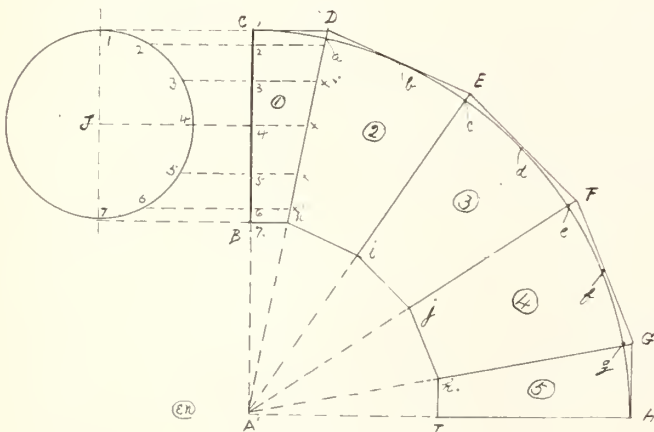


STUDY PATTERN DEVELOPING IN SPARE TIME.

Many a bright lad has been spoiled in our tinshops because of the spare time which seemed to hang on his hands. He becomes careless in a thousand and one ways, when if some little encouragement had been given him this same boy might have been a boon to the shop. There are thousands of smart fellows in and around our sheet metal and tinsmith shops who only partially learned the trade.



Plan of expansion tank piping, submitted by A.D.H.



PROFILE OF FIVE PIECE ELBOW

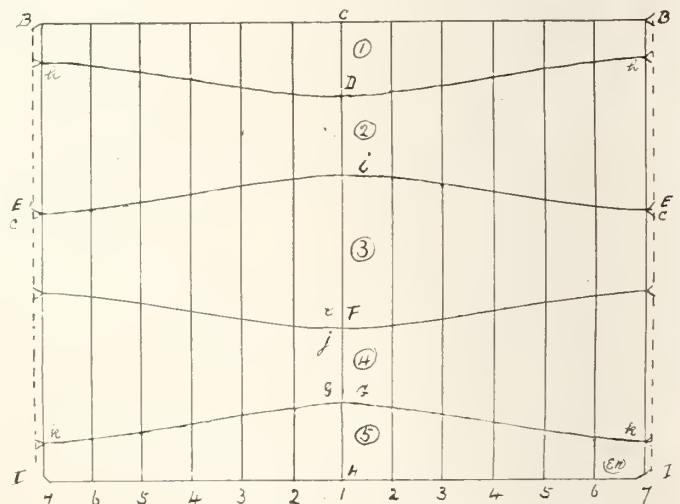


FIG 2. PATTERN OF FIVE PIECE ELBOW.

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50 BRENNAN
STREET

MONTREAL

301 CHAMBERS
STREET

WINNIPEG

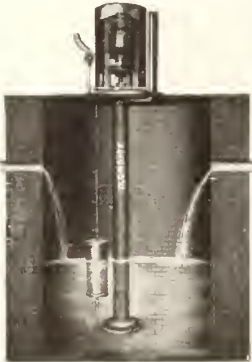
“ECONOMY” SEWAGE EJECTORS

SINGLE AND DUPLEX
UNITS

will automatically EJECT any QUANTITY of Sewage at any HEAD. They are adapted for MUNICIPAL DISPOSAL PLANTS and CITY BUILDINGS. The ECONOMY may be operated by ELECTRICITY, STEAM or GAS ENGINE.

Write for information on THE ECONOMY DUPLEX DRY PUMP CHAMBER EJECTOR and for the ECONOMY CATALOG.

Canadian Distributors: Francis Hankin & Co., Mail Bldg., Toronto, Ont.; Coristine Bldg., Montreal, Que.; Notzel Engineering & Supply Co., Duncan Bldg., Vancouver, B.C.; J. A. McTaggart, Travelers Bldg., Winnipeg, Man.

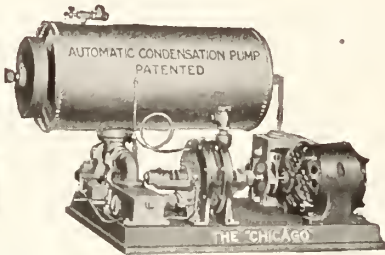


Automatic Electric Bilge Pump
Manufacturers

THOMAS & SMITH, Inc., 116-118 N. Carpenter St., Chicago, Ill.

How to Place Radiation Below Water
Level in Boiler

Save Digging a Boiler Pit and 20-50% Coal



Write for Catalog D, giving the above information and describing the

“ CHICAGO ”

Condensation Pump and Tilting Tank Receiver.

CHICAGO PUMP
COMPANY

915 W. Lake Street,
CHICAGO, ILLINOIS

ALPHABETICAL LIST OF ADVERTISERS

Occasionally advertisements are inserted in the paper after the index has been printed. The insertion of the Advertiser's name in this index is not part of the advertising order.
The index is inserted solely for the convenience of the readers of the paper.

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J		Watson & Paul	34
Jenkins Bros.	29		
K			
Kerr Eng. Co., Ltd.	Inside Back Cover		

Peerless

WATER SERVICE SYSTEMS

Easily and Quickly Installed, Absolutely Guaranteed.

The "PEERLESS"

Silent Electric

HOUSE PUMP

This pump is simplicity itself and will deliver 125 gallons per hour. Can be entirely dismantled by unscrewing one thread.

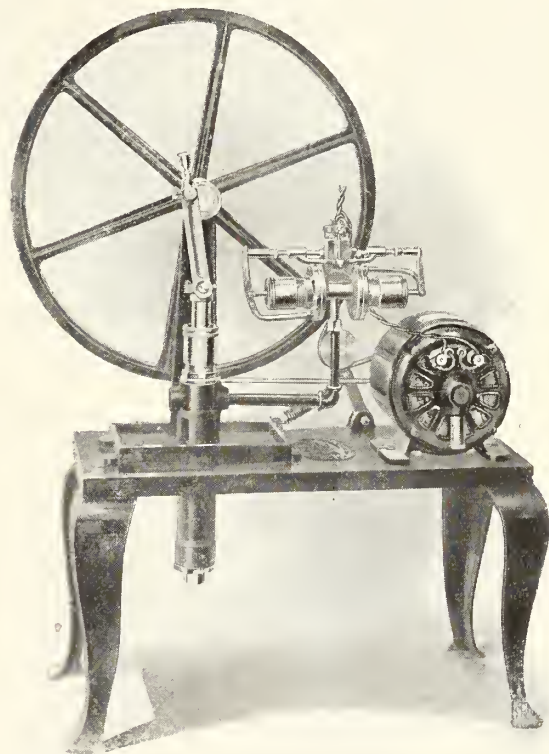
It is made of the best material money can buy. It is machined and fitted by experts who study every condition under which these pumps will be placed. It is fitted with ball bearings, one inch piston rod, solid rubber disc valves on brass seats, both ends of brass connecting rod have adjustable bearings—main arm, pump cylinder and drip pan cast in one, no joints to work loose.

One hour's pumping will take care of all domestic demands made upon it by a family of six, allowing each 20 gallons per day.

It is operated by a one-eighth Horse Power Electric Motor and takes no more power than an ordinary lamp.

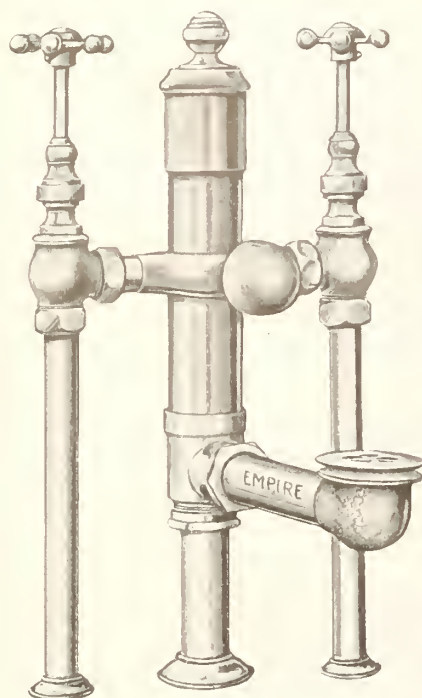
It can be fitted with automatic electric switch suitable to operate on either open or closed tank.

It is fully guaranteed as to capacity, mechanical construction, and workmanship. Made in Toronto by Canadian labor, with Canadian capital, for Canadian people.



National Equipment Company, Limited

TORONTO, ONTARIO



Sitz Bath Set of Bell Supplies and Waste

The Figuring of time is always the Sticker on any job

On any large contracts there is always an allowance made for unforeseen troubles over and above the possible minimum time.

If you want to minimize this item and add it to your profits use

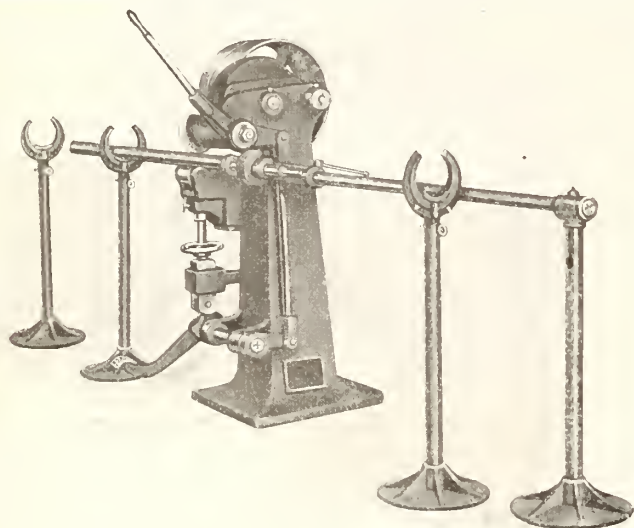
EMPIRE PLUMBING GOODS

All our fittings are made to standards and thoroughly tested and inspected before leaving the factory and are guaranteed to fit exactly the fixtures they are intended for.

If you have not used them, specify them in your next order, if you have, we know you will continue to use them.

Empire Mfg. Co., Ltd.

Head Office and Factory, LONDON, Ont.
Montreal Office, Room 31, C. P. R. Telegraph Bldg.
Winnipeg Office, 109 Carlton Block, Portage Ave.



The Hall No. 2 Rapid Upright Roller Pipe Cutter for Rapid Work and a Clean Cut

By repeated tests this machine has proven the most efficient and economical pipe cutting device on the market, and is used for this purpose by all of the tube mills in Canada and most of the leading plumbing and steam-fitting houses.

Regular capacity $\frac{1}{2}$ to 2-in., with extra cage will take $\frac{1}{8}$ to $\frac{3}{8}$ -in. pipe.

Write us for catalog and prices on pipe threading lathes, any capacity from $\frac{1}{8}$ to 18-in., also single and double head rapid nipple machines. No delays, delivery from stock.

JOHN H. HALL & SONS, Limited
BRANTFORD, CANADA

300,000 lbs.

carried in stock for immediate
shipment of

Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

Brass and Copper Rod.

Brass and Copper Sheet.

Tallman Brass & Metal Co.
HAMILTON, ONT.

RADIATOR TRAPS

There are radiator traps that work, others that last; the secret is to get the trap that lasts while it works and works while it lasts.

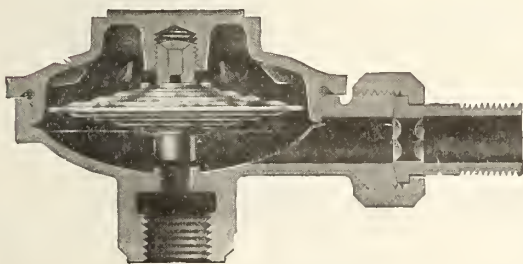
Twelve years ago the first Dunham Trap was put on the market. It made use of a simple principle which has since revolutionized Vacuum Steam Heating methods. Old competitors ridiculed it—fought it—but the Dunham Trap won and has been winning since. The whole secret was *superior service*.

The Dunham Trap has proven more efficient and of longer life than the old types, and has forced the old float-trap manufacturers to imitation.

You want—

A radiator trap that does not have to be especially adjusted or fitted for each particular condition, but one that you know will work under all conditions and last throughout the life-time of the installation. A trap that will help to cultivate profitable customers for you.

THE "DUNHAM" IS THE TRAP



(Made in Canada)

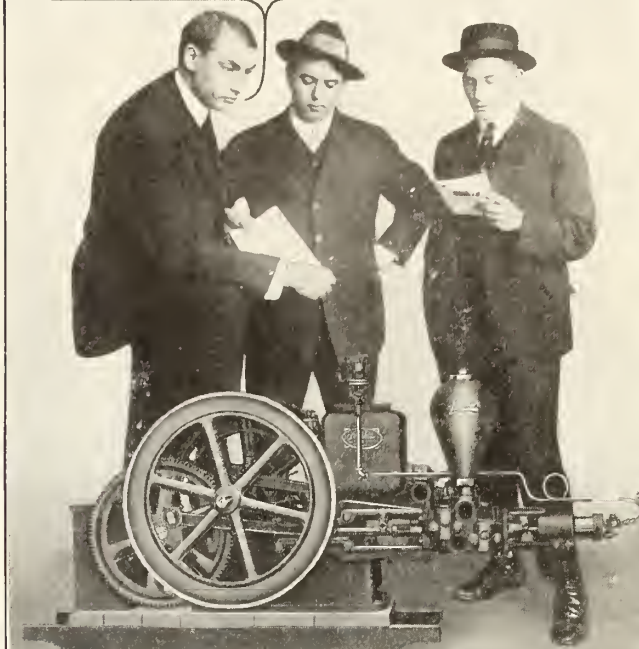
Performs the functions of a Radiator Steam Trap perfectly and continuously. Eliminates water and air without loss of steam.

Write for particulars of our "Try Out Plan."

C. A. DUNHAM CO., Ltd.
Toronto, Can.

Vancouver—520 Duncan Bldg.
Calgary—Metals Limited.
Winnipeg—215 Phoenix Bldg.
Montreal—No. 24-11 St. Sacrament St.
Fort William—Plumbing & Engineering Supply Co.
Halifax—General Contractors Supply Co., 98 Granville St.

"ABUNDANCE OF POWER AND
LARGE CAPACITY AGAINST
HIGH PRESSURE-AT LOW COST"



Above illustration taken from front cover of the "Leaderite," January issue, published monthly by the Leader Iron Works.

KNOWLEDGE OF THE GOODS MAKES SALES

¶ Look the field over and you will find that the successful man is the one who understands his business to its smallest detail. Salesmanship is more than half knowledge of what is being sold and an understanding of what is required in the way of equipment and for what purpose it is to be used is an absolute essential

¶ The *Leader* management first made a study of the general field for country water supplies and then designed an equipment that would do that work, each man in the Sales Department being required to familiarize himself with every article in the catalog, not in a mechanical sing-song way, but to know absolutely, and to be able to answer intelligently questions which come to the mind of the purchaser.

¶ Dealers generally are urged to make a study of the Leader and competitive lines, compare every point of advantage and disadvantage of the various machines and tanks, and to call on any Leader office when in need of information. If we cannot give it, we will tell you who can.

¶ Perfect frankness is a general rule with the Leader. All salesmen are instructed against advising the use of Leader equipment if, in their opinion, some other piece of goods is better suited to the place.

Leader

"Our mark of gold is a symbol of everlasting value."

DISTRIBUTORS:

**The GENERAL SUPPLY COMPANY
OF CANADA, Ltd.**

TORONTO

OTTAWA

WINNIPEG

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

Condensed or "Want" Ads.**FOR SALE**

WILL SELL THE EXCLUSIVE RIGHTS OF handling the B-H Vapor Vacuum Specialties in Canada to reliable party. Address B-H Vapor Vacuum Heating Co., Emporia, Kansas.

READERS

The Editor wishes every one interested in

**Domestic Sanitary
Heating and
Ventilating
Engineering**

to make use of this paper. Any article or problem of interest, any topic of note will be used if any such has a tendency to uplift the Trade.

Every local or provincial association can use this paper free of charge to make other members acquainted with the business done and benefits derived from being an organized body.

When writing advertisers kindly mention having seen the advertisement in this paper

STUDY**These Uncrowded Professions**

Sanitary Science and Engineering, Sanitary Inspectorship, The Science of Plumbing, Hygiene, under the directorship of Prof. Arthur Bateman, M. Inst. S.E., A. R. San, I., M. I. P., R. P. C., Eng

SUCCESS GUARANTEED.

Write for free booklet.

Desk 3

Anglo-American Sanitary Correspondence College, 10-12 W. Ontario St., Chicago, Ill.

One of the most successful retailers of late years says: "When a firm advertises in trade papers it is getting into good company. As I pick up one of a dozen of these periodicals here in my office, and glance through it, I find that the best people, the successful firms, are represented in such a way as to reflect their importance in the trade."

SYPHONS

FOR
SEPTIC TANKS

WATSON AND PAUL
93 St. Genevieve Street, Montreal



**GENUINE
ARMSTRONG STOCKS
and DIES**

FOR THREADING PIPE OR BOLTS

KNOWN, USED,
COMMENDED EVERYWHERE

PIPE MACHINES,

both Hand or Power

HINGED PIPE VISES

PIPE CUTTERS

PIPE WRENCHES

RATCHET ATTACHMENTS

BARD ADJUSTABLE

BUSHINGS

Manufactured by

**THE ARMSTRONG M'F'G.
CO.**

317 Knowlton St.

BRIDGEPORT, CONN., U.S.A.
NEW YORK CHICAGO

WRITE FOR CATALOG

Only One

kind is necessary for your various jobs—fittings or pipe. You can save the cost and the carrying about of more than one tool.



Williams' "AGRIPPA" Chain Wrenches are recommended unconditionally.

Williams' "AGRIPPA" Chain Wrenches do not depend upon only one point of contact for a bite—long life of wear assured.

Williams' "AGRIPPA" Chain Wrenches never place any compounded strain upon the chain—continuous operation assured.

Williams' "AGRIPPA" Chain Wrenches bear every mechanical feature necessary to complete utility and service — operating efficiency guaranteed.

YOUR DEALER WILL SERVE YOU.

J.H. Williams & Co.

Superior Drop-forged Tools

77 Richards St., Brooklyn, N.Y. City

40 So. Clinton St., Chicago, Ill.

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Classified Buyers Guide

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Asbestos Goods.
Can. Johns-Manville Co., Toronto.

Air Line Systems.
C. A. Dunham & Co., Ltd., Toronto.

Aluminum Casting.
Tallman Brass & Metal Co., Hamilton.
Canada Metal Co., Toronto.

Brass Castings.
Tallman Brass & Metal Co., Hamilton.
James Morrison Brass Mfg. Co., Toronto.

Brass Goods, Valves, Etc.
James Morrison Brass Mfg. Co., Toronto.
Wallaceburg Brass Mfg. Co., Wallaceburg, Ont.
Empire Brass Mfg. Co., London.
Dunham, C. A., Toronto.

Brass Pipe and Tube.
Empire Brass Mfg. Co., Toronto.
Tallman Brass & Metal Co., Hamilton.
Canada Metal Co., Toronto.

Boilers, Steam or Hot Water.
Warden, King, Ltd., Montreal.
Steel & Radiation, Toronto.
Pease Foundry Co., Ltd., Toronto.

Burners.
Standard Heating & Radiator Co., Pittsburg, Pa.

Correspondence Schools.
Anglo-American Sanitary School.

Country Residence Equipments.
National Equipment Co., Toronto.

Chicago Pump Co., Chicago.
Leader Iron Works, Chicago.

Closets.
Empire Brass Mfg. Co., London.
James Morrison Brass Mfg. Co., Toronto.
Galt Brass Co., Galt.
Amherst Foundry Co., Amherst, N.S.
Johns-Manville Co., Toronto.

Drainage Fittings.
Fittings, Limited, Oshawa.
Warden, King, Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Empire Brass Mfg. Co., Ltd., London.

Ejectors, Steam.
James Morrison Brass Mfg. Co., Toronto.
Kerr Engine Co., Walkerville.
Tallman Brass & Metal Co., Hamilton.

Ejectors for Sewage.
Chicago Pump Co., Chicago.
Thomas & Smith, Chicago.
National Equipment Co., Toronto.

Fittings.
Fittings, Limited, Oshawa.
Steel & Radiation, Ltd., Toronto.
Warden, King, Ltd., Montreal.
James Morrison Brass Mfg. Co., Toronto.
Empire Brass Mfg. Co., London.
National Steam Specialty Co., Chicago.

Generators.
Honeywell Heating Specialty Co., Montreal.
James Morrison Brass Mfg. Co., Toronto.

Heaters.
Steel & Radiation, Ltd., Toronto.
Warden, King, Ltd., Montreal.
Standard Heating & Radiator Co., Pittsburg, Pa.
Pease Foundry Co., Ltd., Toronto.

Lead.
Canada Metal Co., Ltd., Toronto.
Tallman Brass Mfg. Co., Hamilton.
Empire Brass Mfg. Co., London.
James Morrison Brass Mfg. Co., Toronto.

Machinery Pipe Threading.
Hall & Sons, Ltd., Brantford.

Nipples.
Canadian Tube & Iron Co., Ltd., Montreal.
Warden, King, Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Canada Metal Co., Ltd., Toronto.
Galt Brass Co., Galt.
Canadian Brass Co., Galt.
Empire Brass Mfg. Co., Ltd., London.
Wallaceburg Brass Mfg. Co., Wallaceburg.
Canadian Wolverine Co., Ltd., Chatham.
James Morrison Brass Mfg. Co., Toronto.

Packing.
Canadian Johns-Manville Co., Ltd., Toronto.

Pipe, Black and Galvanized.
Canadian Tube & Iron Co., Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Warden, King, Ltd., Montreal.

Pipe, Soil, and Fittings.
Empire Brass Mfg. Co., London.
Galt Brass Mfg. Co., Galt.

Pumps.
Leader Iron Works, Chicago.
Chicago Pump Co., Chicago.
C. A. Dunham & Co., Ltd., Toronto.
National Equipment Co., Toronto.
Thomas & Smith, Inc., Chicago.

Radiators.
Warden, King, Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.

Reducing Pressure Valves.
C. A. Dunham & Co., Ltd., Toronto.

Steam Specialties.
Dunham, C. A., Co., Toronto.
National Steam Specialties, Pittsburg, Pa.
Mouat-Squires Co., Cleveland.
Honeywell Heating Specialty Co., Montreal.
Kerr Engine Co., Walkerville, Ont.
The E. S. Manny Co., Montreal.
Dart Union Co., Ltd., Toronto.

Tools.
Canadian Tap & Die Co., Ltd.
Borden-Canadian Co., Toronto.
Nye Die, Tool & Machine Co., Chicago.
Hall & Sons, Ltd., Brantford.
Armstrong Mfg. Co. Bridgeport, U.S.A.
Williams, J. H., & Co., Brooklyn, N.Y.

Unions.
Dart Union Co., Ltd., Toronto.

Vacuum Systems of Heating.
C. A. Dunham & Co., Ltd., Toronto.

Nothing Like It as a Compression Stop and Waste—It's a Winner

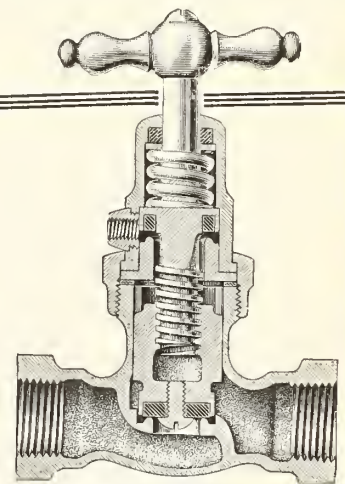
Progressive plumbers everywhere are using MUELLER COMPRESSION S. & W. COCKS, the best thing of the kind ever offered the plumbing trade.

Order some of these cocks for your next job, you'll be pleased with them—so will your customer.

Mueller Stop and Waste Cocks are mechanically perfect. They can't waste until entirely shut off. No pressure passes through the waste hole. Every part is interchangeable—a big, strong point if you should ever need a repair. You're not apt to need it, however — these cocks are built to wear.

They are tested under 200 pounds hydraulic pressure and unconditionally guaranteed.

H. MUELLER MFG. CO., Ltd.
Sarnia, Ontario, Canada



D-8677

S.E.

**H. Mueller
Mfg. Co. Ltd.
Sarnia, Ont.**

Give me further
information and
prices on Mueller
Compression S. & W.

Signed.....

City..... Prov.....

Dead-beat and there's two hours to go yet!

Haven't you ever felt that way?

Haven't you often wondered, round about four o'clock, how on earth you were going to last out the other two hours?

Your job is no cinch, it's work—real hard going—from the time you start in the morning till you quit in the evening.

And so you don't want to make it any more strenuous by pulling and slaving at that old die-stock with its wide, jamming dies; with its binding thread tearing propensities.

Get a

Premier Die Stock

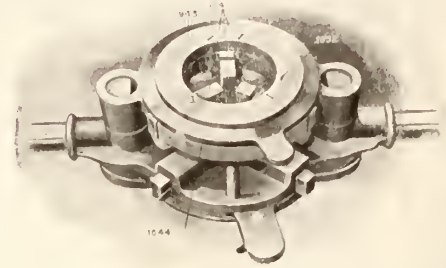
with narrow receding dies, that start on the pipe at full depth of thread and automatically back themselves off, and you'll find yourself feeling more fit at the end of the day, more able to look forward to the evening's enjoyment, less like going off to bed as soon as you get home.

The Premier takes only just enough power to cut the threads. Its automatic movements are accomplished without the use of lead screw or loose parts.

No. 1 cuts $\frac{1}{2}$ -inch to $1\frac{1}{4}$ -inch right, left hand dies extra.

No. 2 cuts 1-inch to 2-inch right and left hand with the same dies.

Ask your dealer to show you one.

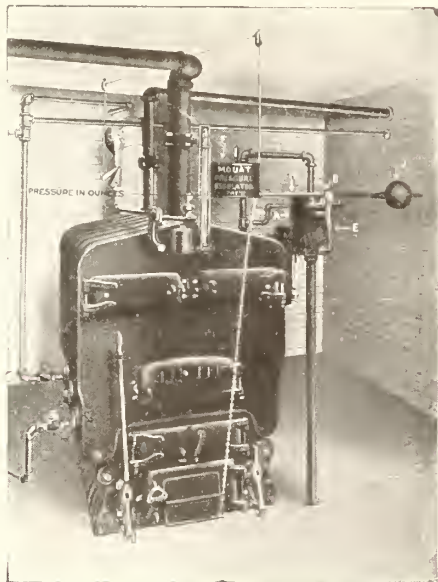


Rear View of Die Stock

BORDEN-CANADIAN COMPANY, Toronto, Ontario

The Mouat Graduating Vapor Heating System

Positive temperature control at each radiator.
Any fractional portion of a radiator may be heated to suit weather conditions.



The Mouat Automatic Vapor and Damper Regulator is the simplest, safest and most efficient device of its kind on the market.

Live heating contractors wanted to represent us in the Dominion.

Write to-day for our proposition.

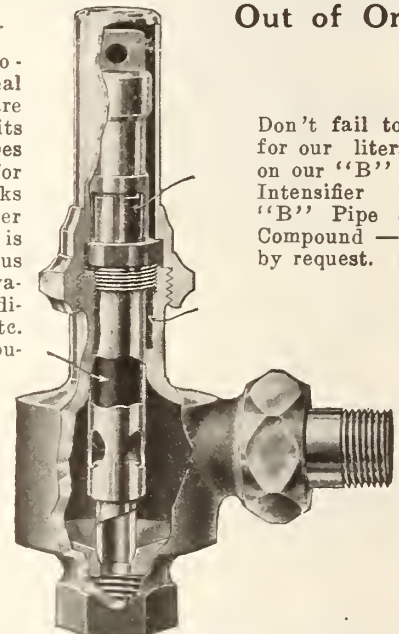
The Mouat-Squires Company, Cleveland, Ohio

NATIONAL VALVES

**Are Ordered and Reordered
—Never Get Out of Order**

National Thermo-static is an ideal valve. Its claims are based only on its deeds, and it does what is claimed for it and more. It works faithfully and never jumps its job. It is adapted to various work. For use on vacuum systems, radiators, heat coils, etc. No deformation troubles possible; the brass encased composition prevents it from being buckled or bent.

More merits about the valve by writing for more information.



Don't fail to ask for our literature on our "B" Heat Intensifier and "B" Pipe Joint Compound — free by request.

NATIONAL STEAM SPECIALTY CO.

24-26 S. Clinton Street, CHICAGO
Surplus, Dunn & Co., 74 Murray Street, NEW YORK
L. N. Vanstone, 8 Wellington St. East, Toronto. Moncrieff & Endress, Limited, Scott Building, Winnipeg.

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

T·R·I·O

Always Ready
Always Right
Cuts 3 sizes



Nothing to Lose
Nothing to Adjust
Nothing to Break

You don't need to "dope" pipe joints where the "T.R.I.O." stock is used, because it holds the famous "L.G." Pipe Dies.



IT'S A PLEASURE TO WORK WITH "L. G." DIET.

THEY CUT CLEAN, SMOOTH THREADS EASILY AND QUICKLY AND THE T.R.I.O. STOCK HOLDS THEM IN A THREE-ANGLE GRIP TIGHTER THAN A VISE.

Pipe joints made with (L—G—)
Dies have stood this test

Many a time—without a touch of
lead, plumbago or any "dope" on
the joint.



CANADIAN
TAP AND DIE COMPANY
GALT, ONT.



This is The Radiator Valve You Have Been Waiting For

An absolutely PACKLESS valve, with no composition rubber rings or discs in the bonnet to take the place of packing.

An all metal valve with accurately ground cone joint in bonnet, which will not score, cut or become unevenly worn, as the spindle bearing runs the length of the bonnet spindle cavity.

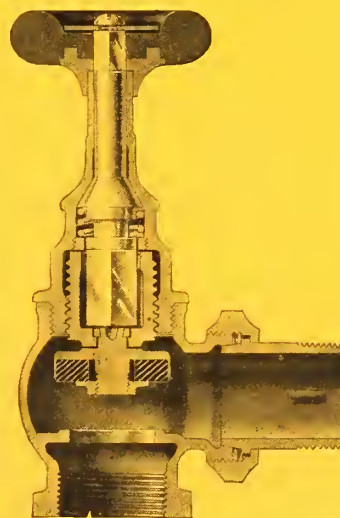
No strain on the stem or stem seat at any time other than the tension of the phosphor non-corrodible spring which holds it in its place.

All the thrust is against the threads on the disc carrier and in the heavy bonnet. The stem simply acts as a KEY to revolve the disc carrier. No inexperienced person can tamper with the working parts of this valve, as they are all

securely locked inside the valve.

Every valve tested with steam, and we guarantee them to be tight.

Give this valve a trial on the next vacuum job or high class steam heating plant.



The Kerr Engine Company, Limited,
Valve Manufacturers,
WALKERVILLE, - - - - - ONTARIO

TRADE MARK
GALT BRASS

Overflow Tube
Telescopes

Waste Tube
Telescopes



No Time Lost
Connecting
THE
"ADJUSTO"

Cast Brass Strainer

Cast Brass Waste Plug

Cast Brass
Coupling Nuts

Manufactured
only by

GALT BRASS CO., Limited, GALT, CANADA



Wolverine "One Piece" Basin Supplies

(Patented)



Separate Wolverine Flexible Joint Connection. Furnished on any $\frac{3}{8}$ -inch I.P. Basin Supply by specifying "C" after figure number.



Lead Cone Packing. Furnished on any Supply instead of Rubber by specifying "L" after figure number.



To receive $\frac{1}{4}$ -inch I.P. Tall Piece. Furnished on any $\frac{3}{8}$ I.P. Basin Supply by specifying "R" after figure number.

Special annealed brass tubing with slip joint nut for $\frac{1}{2}$ -inch iron pipe or with $\frac{3}{8}$ -inch I. P. Thread for floor or wall connections.

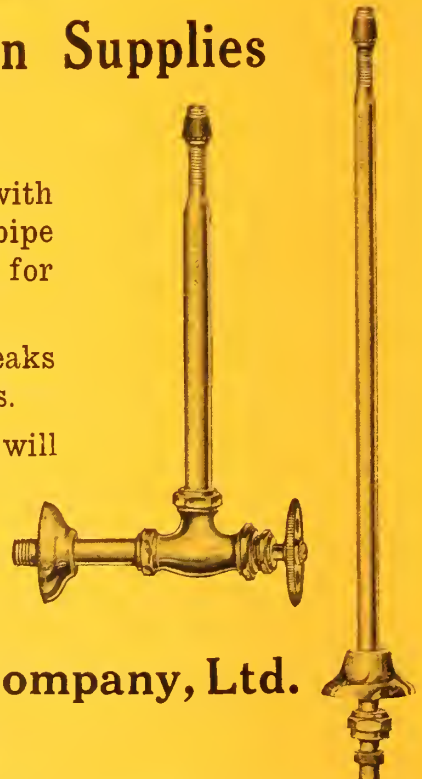
The Flexible Joint eliminates leaks at connections under the basins.

Heavy deep flanges which will not dinge, as is often seen with inferior fittings.

Manufactured by

Canadian Wolverine Company, Ltd.

Chatham, Ont.



THE SANITARY ENGINEER PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 701-702 Eastern Townships Bank Bldg.
LONDON, ENG., 88 Fleet St. E.C.

TORONTO, 143-149 University Ave.
CHICAGO, 140 S. Dearborn St.

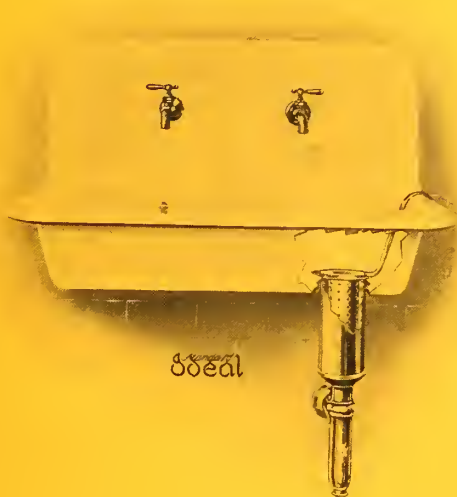
WINNIPEG, 34 Royal Bank Building
NEW YORK, 115 Broadway

Vol. VIII.

Publication Office: TORONTO, FEBRUARY 2, 1914

No. 3

Standard Ideal "SANISTRAINER" - PATENTED -



F-321—18x30 Roll Rim Sink supported on Concealed Hangers, and with Sanistrainer.

LIST PRICE \$14.50

Fuller Bibbs and 1½-inch P Trap as shown, \$5.75 extra. **Additional Patterns in preparation.**
The **Sanistrainer** represents the most notable advance made in the improvement of Sink Strainers during recent years, and meets the demand for a Strainer that not only strains but also **COLLECTS THE REFUSE OF THE SINK** in such a manner that it can be conveniently removed, without coming in contact with the hands.

The combined **Refuse Collector and Strainer** (Fig. 1) may be conveniently lifted from the Sink for emptying and cleaning, and the liability of the Drain becoming clogged while the Strainer is removed is eliminated by a secondary Strainer Plate, as shown in Illustration (Fig. 2).

The Sanitary and Convenient Features of the Sanistrainer should appeal instantly to any Housewife, and if these are displayed in your Show Room, they should become ready and extensive sellers.

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

TORONTO
119 King St. East

MONTREAL
42-44 Beaver Hall Hill

WINNIPEG
76-82 Lombard St.

VANCOUVER
410 Carter Cotton Bldg.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

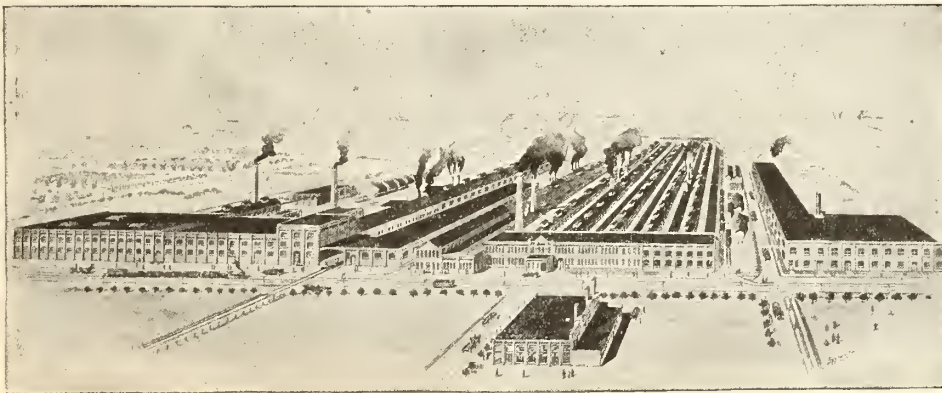
General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co.,
178 Victoria St., Toronto

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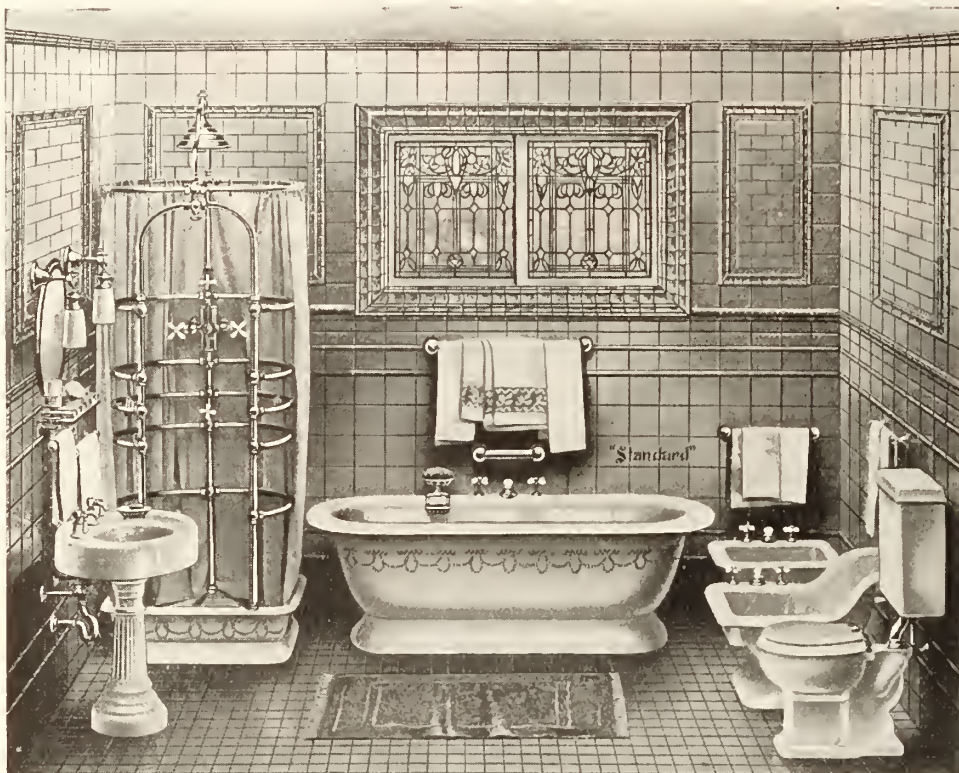
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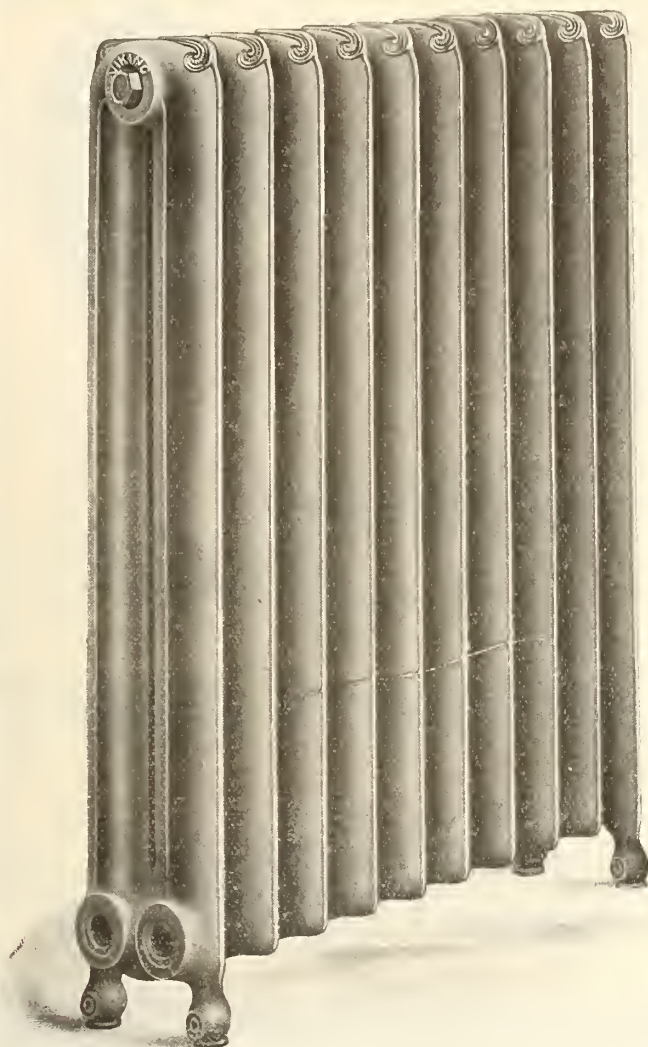
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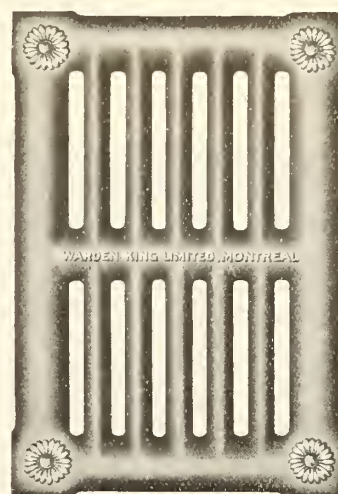


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PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, FEBRUARY 2, 1914

No. 3

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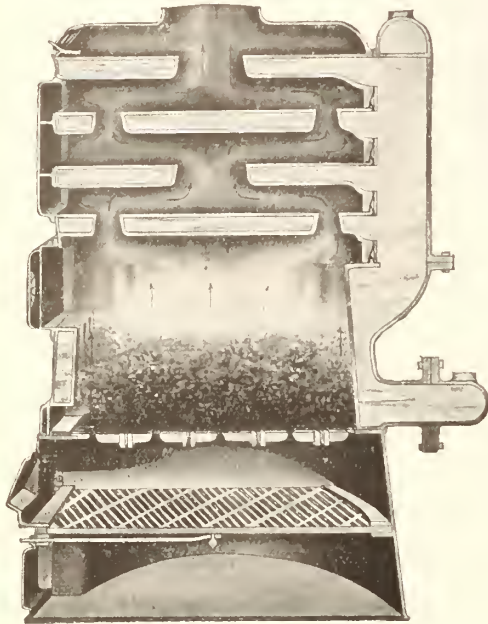
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VOL. VIII.

FEBRUARY 2, 1914.

No. 3

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New Brunswick Society of Domestic Sanitary & Heating Engineers



St. John, N.B., Jan. 20.—The annual convention of the New Brunswick Society of Domestic, Sanitary and Heating Engineers was held in St. John recently and was even more of a success from every standpoint than in previous years. The society during the few years of its existence has greatly prospered and has found a ready response to its aims and endeavors amongst the members of the profession, through the province, the sympathy and interest excited in its welfare being responsible for a vastly increased membership. It has done much good work since its inception and hearty credit is due to those responsible, particularly to some who now hold official honors, notably W. J. Crawford, D. J. Shea and some others. Branches have been established in many towns throughout New Brunswick and the society has been most active in pursuing the objects for which it was organized.

At the sessions of the convention which were held in Foresters' Hall, Coburg street, closing with a most enjoyable banquet in the dining hall of the Victoria Hotel, much business of interest was transacted, and there was an encouraging attendance. The president of the society, George Blake, chief of the St. John Fire Department, occupied the chair, with W. J. Crawford acting as secretary. Other members in attendance were as follows:—D. J. Shea, Fredericton, N.B., vice-president; Joseph and Thomas Feur, J. C. Churchill and J. B. Pickles, of Woodstock, N.B.; A. H. Farrell, R. H. O'Brien, Walter Sentner, George Wandless, and Edward Hurley, of Fredericton; Hugh Marcus and A. H. English, of Campbellton, N.B.; L. H. Estano, Wm. Watson, G. S. Dorman, Eli Brooks and W. J. McCarthy, of Moncton, N.B.; H. L. Regan and Earle Steeves, of St. Stephen, N.B.; and F. S. Walker, E. N. Herrington, J. S. Coughlan, G. W. Williams, W. B. McDonough,

Thos Kane, J. H. Noble, J. H. Doody, jr., R. H. Fitzgerald, D. Peer, Jeremiah Buckley, D. Doyle, H. Codner, P. Campbell, W. C. Emerson, and J. J. McNeeley, all of St. John.

Among the matters taken up was the subject of technical education in the public schools, the society members being decidedly in favor of the project. The various advantages accruing from its introduction were clearly defined by different speakers, dwelling upon the growing importance of a firmer school knowledge by apprentices and sanitary engineers. The matter of apprenticeship was also gone into quite extensively as well as other items of interest to the profession, dealing with general business, ordering, purchasing, etc.

The visiting delegates were the guests of the members of the local branch of the society at a sumptuous and delightfully arranged banquet in the evening at the Victoria Hotel, President Blake presiding and having many friends of the society as guests. An orchestra was present and furnished a choice program of well selected airs. After hearty justice had been accorded the good things provided upon the tastefully prepared menu, there was an entertaining round of post-prandial numbers. Mr. Blake in behalf of his fellow members gave an address of welcome to those present which was well received.

The toast to the King was honored in music. Following this was the toast to the City of St. John, to which Mayor Frink and Commissioners Wigmore and Agar responded, each of whom referred to the improved sanitary conditions in and about St. John and in other parts of the province following the launching of the N.B. Society of Domestic, Sanitary and Heating Engineers and paid the members a well-deserved compliment upon their activity in all public and private matters in this connection. Mayor Frink particularly said he was

pleased with the efforts of the society and the recognized importance of its interest in civic and housing affairs.

This toast was followed by another musical selection after which the toast to the Board of Health was drunk, responses being made by members of that body present as guests, Judge Armstrong, John Kelly, and Dr. G. G. Melvin, chief health officer. These made fitting reference to the co-operative spirit existing between the society and the boards through the province as well as the provincial board, and also to the fact that since the last annual meeting members of the profession had been placed upon the respective health boards in New Brunswick and also upon the provincial board. J. S. Coughlan was here called upon and gave a pathetic ballad of original composition "Daddies' Trousers Will Soon be Filled by Willie."

The toast to the Provincial Association responded to in glowing terms by D. J. Shea, A. H. Farrell, Earl Steeves, J. H. Noble, and W. J. Crawford; this being followed by a banjo selection by Mr. Buckley, who gave a medley of piccaninny airs. W. A. McLaughlin, H. J. O'Neil, and W. J. Hill were heard in pleasing speeches in response to the toast "The Supply Houses," after which a vocal duet by Wm. McDonough and Daniel Doyle entitled "On the Old Fall River Line" proved very appreciative. R. Garnet entertained with a vocal solo, after which F. Neil Brodie and Wm. Murdoch were heard in reply to the toast "The Future City of St. John," giving pleasure to all. H. Codner gave a reading, while Mr. Noble entertained with a solo entitled "The Milkman's Serenade—Shall We Gather at the River?" both of which were well received. An orchestral selection followed after which "Auld Lang Syne" was sung and the gathering dispersed, voting the evening one of the most enjoyable yet conducted by the society.

National Convention Delegates Chosen.

At the convention recently held in St. John's, N.B., by the New Brunswick Society of Domestic, Sanitary & Heating Engineers, Messrs. Watson, Dorman-Farrell and Shea were appointed as delegates to the annual convention of the National Association which is to be held in June at Ottawa, the Capital of the Dominion.

A Perfect Sewerage System for Rural Homes and Schools

Showing the Simplicity of a Septic Sewage Disposal Plant, That Cesspools Should be a Thing of the Past.

By M. J. Quinn.

Illustration by the kind courtesy of National Equipment Co., Toronto.

It is perhaps no exaggeration to say that, having regard to the frequency with which it comes up for consideration, and many other circumstances, the question of properly disposing of sewage is one of the most important matters with which the health authorities throughout the country have to deal, and yet it is a remarkable fact that in these days of popular education, when the people enjoy the benefit of free literature and lectures on fruit growing, dairying, domestic science, etc., that a knowledge of so important a subject, and one so closely allied to their physical and moral welfare is confined to a limited number.

True a vast amount of experimenting has been done during recent years, and the matter has received a great deal of attention from scientific men, the results of whose labors have been freely discussed at medical conventions and reported in medical journals, but the valuable information so obtained has not reached the great mass of the people at all.

In the matter of public sanitation, the question of disposing of sewage in small towns and villages as well as in less populated districts, where by reason of its great cost a general system of sewerage is impossible, is daily becoming of greater importance, and as the title of my paper would indicate, that is the phase of the question with which I propose to deal. The system to which I intend to refer is known as the septic tank system, and I believe that nearly all who have studied it are agreed that it is at once the most natural, most scientific, simple and economical system in use to-day, and speaking from a personal knowledge of scores of these systems, I am in a position to say that it is worthy of all the good things that are said of it.

I realize, that, apart from a description from a mechanical standpoint, anything I might say to medical men regarding the system would be superfluous, but for the benefit of the layman who may be in need of information on the subject, and in order to emphasize the necessity of carrying out every detail, in constructing a system as hereafter described, I deem it wise to briefly refer to the fundamental principles which govern it.

Types of Bacteria and Their Action Upon Sewage.

It is a matter of common knowledge that living earth—or top soil,—is a powerful purifying agent, but comparatively few are aware that the presence in it of countless numbers of bacteria, or microbes, is alone responsible for the chemical changes brought about in waste matter placed beneath its surface, and that these bacteria, not only through their action remove and destroy the dangerous properties of such waste matter but actually convert them into plant food, which, being taken up by the vegetation, is again consumed for the sustenance of life.

Pasteur divided these microbes into two classes, viz.:—Anerobes, or those which lived apart from air, or derive their oxygen from decaying compounds, and aerobes, or those which require plenty of fresh air for their develop-

are readily taken up by the vegetation on the surface, and the latter passing up high into the air, as hereafter described.

With this brief reference then, to the principles which underlie what is conceded to be a most efficient system for the disposal of sewage, I propose to indicate how it should be constructed; and in order that I may the more readily make myself plain, I present for your inspection a number of diagrams which I trust will accomplish the desired result.

Location of Tank.

In Fig. 1 is shown a section of a complete system built on level ground, with the tank placed close to the wall of the building,—where in fact the large majority of those now in use are located.

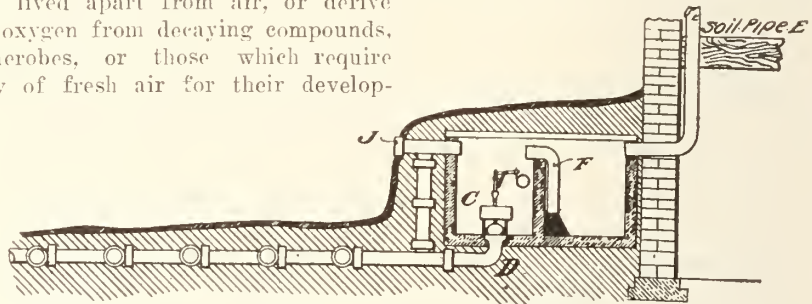


FIG 1

ment, and as both classes are considered necessary for the complete reduction of waste matter, it will be seen that if sewage is placed too deep in the earth, as for instance in a cesspool, where, owing to the absence of air, the necessary aerobic bacteria cannot exist, it may pass down deeper in a putrid state, and, finding its way to the water supply, not unfrequently results in an outbreak of typhoid fever or some other intestinal disease.

The two classes of microbes referred to have properties somewhat differing from each other, but the net result of their work under proper conditions is the breaking down of the solids in the sewage, the disintegrating of its constituents and the conversion of the whole into liquid and gases, in which form it leaves the septic tank, the former to be distributed under the surface of the earth, where by reason of its contact with free oxygen, bacterial life is most active, there to be still further reduced and finally converted into nitrates, which

Material of Which the Tank Should be Built.

The tank should be built of brick or stone, laid in and lined with cement, or of solid concrete, the main object being to have it impervious to moisture.

Screen on Over-flow.

It will be noticed that the tank is divided into two compartments, an over-flow pipe "F" being built into the dividing wall, the mouth of the said over-flow being within seven or eight inches of the bottom of the tank, and being covered with a wire screen about the size of an ordinary pail, the mesh of which screen not exceeding three-quarters of an inch.

Soil Pipe Acts as Ventilator.

The main soil pipe is represented by "E" and should be directly connected with the closet, bath, sink, etc. It extends from the same compartment in which the over-flow is placed to a point two or three feet above the roof, acting not only as a conductor of sewage to the

tank, but also as a channel by which any gases in excess of those in solution may pass out to the atmosphere at a height which renders it impossible for them to inconvenience the occupants of the building.

Fresh Air Inlet.

"J" in the second compartment admits fresh air, which passes freely over the centre partition—spaces being left in the top of the latter for the purpose—and up through the soil pipe to the roof.

Automatic Discharge.

In the centre of the second compartment is placed an automatic valve "C," which is caulked into a four-inch cast iron bend, as ordinarily used by plumbers, and which is securely built into the bottom of the tank during its construction. The top of the hub of the bend is usually left slightly lower than the level of the floor of the tank.

Glazed Tile.

From the said iron bend is run a line of glazed tile pipe, four inches in diameter, having a connection with the fresh air pipe, for the purpose of ventilation, and a number of openings placed at intervals of two feet or more from which are run branches of four-inch field tile with loosely butted joints.

Various Ways.

Fig. 2 shows a plan of the whole system and illustrates one way in which the tile may be laid, though as will be manifest, they would do equally well if all laid on one side of the main carrier in any number of branches, of any length, providing a sufficient number in the aggregate are laid, and the rows are not placed closer together than two feet in light soil, and a somewhat greater distance in heavy soil.

The field tile should not be placed more than one foot below the surface, and must be perfectly level, for the reason that if given a fall the earth surrounding the low ends of the system would receive more than its share of liquid sewage, and might in time become fouled. While if level, the earth surrounding every tile has an equal amount of work to do, and will produce most satisfactory results.

Briefly then, the operation of the system is as follows:—

The sewage from the building enters through soil pipe "E," filling the first compartment in which all solid matter is retained until it is reduced by the contained bacteria which multiply and develop very rapidly. In a liquid form it is allowed to enter the second compartment through over-flow "F" which is turned down because of the presence of the bulk of the organic matter in suspension on or near the surface.

How Tank Discharges.

When the liquid has risen in the second compartment to the height at which the unlocking float on the valve has been set, the valve automatically opens, and discharges the contents of that compartment, be it fifty or a thousand gallons, into the system of field tiles, through which it percolates into the surrounding earth, to be taken care of by nature as already described.

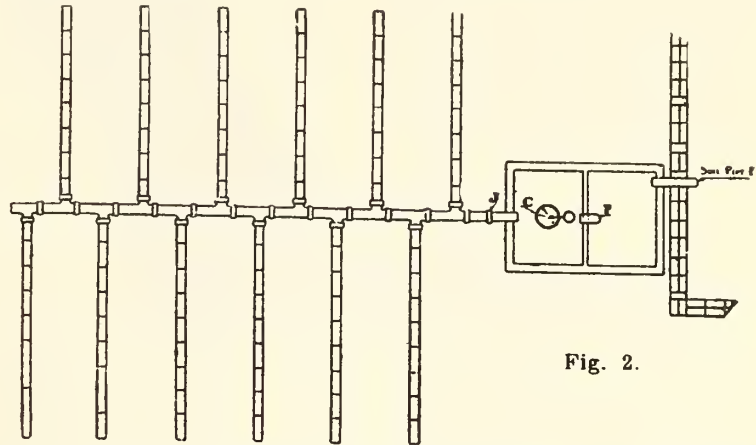


Fig. 2.

The valve is made to discharge liquid sewage at a maximum depth of 24 inches, and a minimum depth of 17 inches, and the top or unlocking float may be set at any point between these two levels.

Depth of Sewage.

As the tank takes from twelve to twenty-four hours to fill, it will be obvious that there will be abundance of time in which the water in the tiles may soak away before it again discharges.

To prevent the gases of decomposition

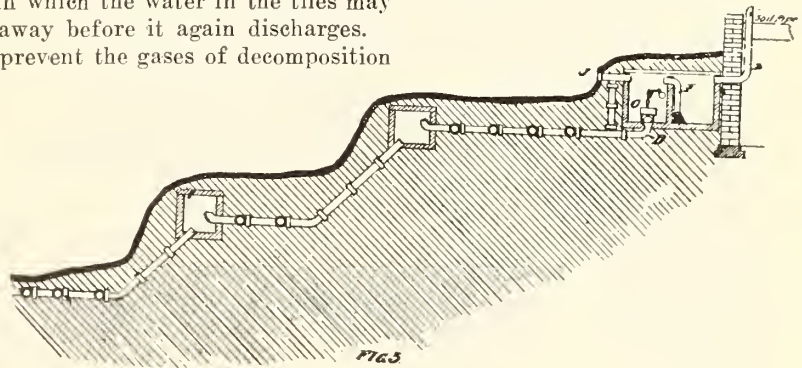
(or one-half the tank) lay thirteen feet of four-inch field tile.

It will be obvious that, as in the case of ordinary stable manure, human excreta, if deposited in its solid state just below the surface of the earth, would entirely disappear in a very short time, and the system just described is merely a most convenient and sanitary way of automatically accomplishing that very desirable result, with the accompanying

advantage of not only depositing it in the earth partially treated, but in a much more favorable condition to receive final treatment than could possibly obtain if the former method were adopted.

Where Tile System Must be Placed.

Anticipating the difficulty which will be encountered where there is a considerable fall in the ground surrounding



escaping through, other than the proper channel the tank must be covered first with rough plank, and then with five or six inches of earth, which in turn, if desired, may be sodded over.

Capacity of Tank.

In figuring out the size of tank necessary, the following may be taken as a safe rule, viz.:—for every occupant of a private house or hotel, allow three cubic feet of space in each compartment, while for a school or factory, where, as in the case of a house, nothing but domestic sewage is to be treated, one-third less space will be sufficient, and for every cubic foot in one compartment

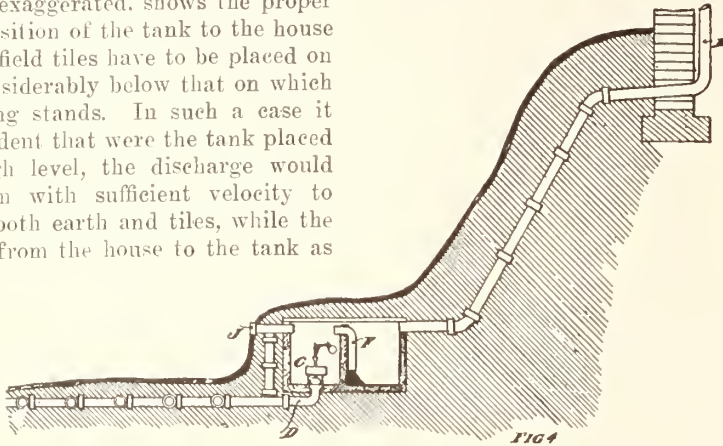
the building to be drained, I would refer you to Fig. 3 which shows a number of terraces each receiving a portion of the effluent from the tank.

It will be noticed that the end of the glazed tile is turned up a few inches on the brow of each terrace, the result of which arrangement being that all the field tiles at each level will fill before the sewage can rise and over-flow to the tiles on the next lower level, where the same operation takes place, and so on for any number of terraces, and as will be apparent the sewage passing into the tiles on a high level cannot possibly escape to those lower down so that the

earth surrounding every tile will have its full complement of work to perform.

Where Tile System Must be Located Considerably Lower Than the Building Served.

Fig. 4, the horizontal scale of which is somewhat exaggerated, shows the proper relative position of the tank to the house where the field tiles have to be placed on a level considerably below that on which the building stands. In such a case it will be evident that were the tank placed in the high level, the discharge would come down with sufficient velocity to wash out both earth and tiles, while the discharge from the house to the tank as



shown will not have any injurious effect on the latter.

It sometimes happens, where large tanks are required, as for instance, in schools, factories, etc., that ground room

Improved Type of Overflow Screen.

The arrangement of the over-flow screen shown in Fig. 6 has proven to be a very satisfactory one. As will be plain, it is merely three pieces of board which, with the cement partition make a

which should be kept in mind in constructing such a system, viz:—

Final Suggestions.

Have the tank covered with a few inches of earth, to prevent the escape of gases, except through the soil pipe stack. See that the valve discharges at least once before the tank is covered in. See that no trap is placed on the main soil pipe to prevent the free passage of air across the tank and up to the roof, and that the necessary space for the air

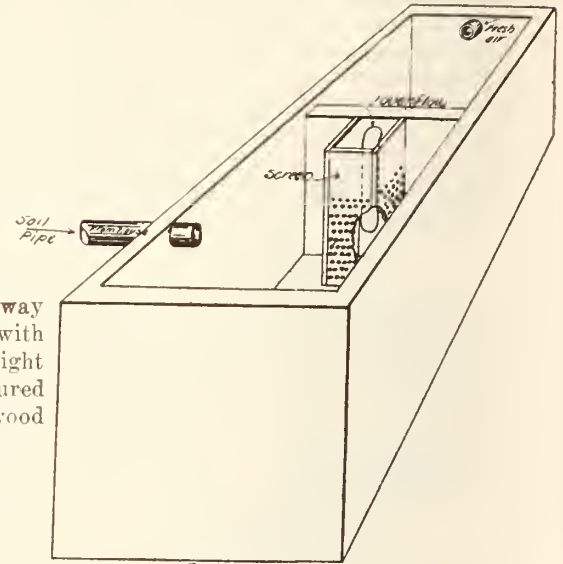


FIG. 6.

box about ten or eleven inches each way inside, it is closely perforated with three-quarter inch holes up to a height of about eighteen inches and is secured in place by a couple of pieces of wood

is left in the top of the centre partition, and, finally, take care that no disinfectants or chemicals of any kind are allowed to enter the tank, if the life of the bacteria, upon which the system depends for its success, is to be preserved.



GOSSIP OF THE TRADE.

Elected Alderman.

It will be interesting to members of the craft to know that our friend H. Mahoney, of Guelph, was elected alderman in that fair city. We may look forward to seeing great things being done as we know he's a worker.

Another member of the craft was invested with aldermanic honors in the person of Mr. Henry, of McDonal & Henry, sanitary engineers, Stratford. Mr. Henry was re-elected as alderman and from reports, we are given to understand he is a good worker for the improvement of sanitary matters. More of our craft should be interested in civic affairs and hope by seeing that various members have been chosen as civic officials, they will take course and see that every city has a member either on the board of health or in some other capacity, so as to act as watchdogs over matters appertaining to good sanitary engineering.

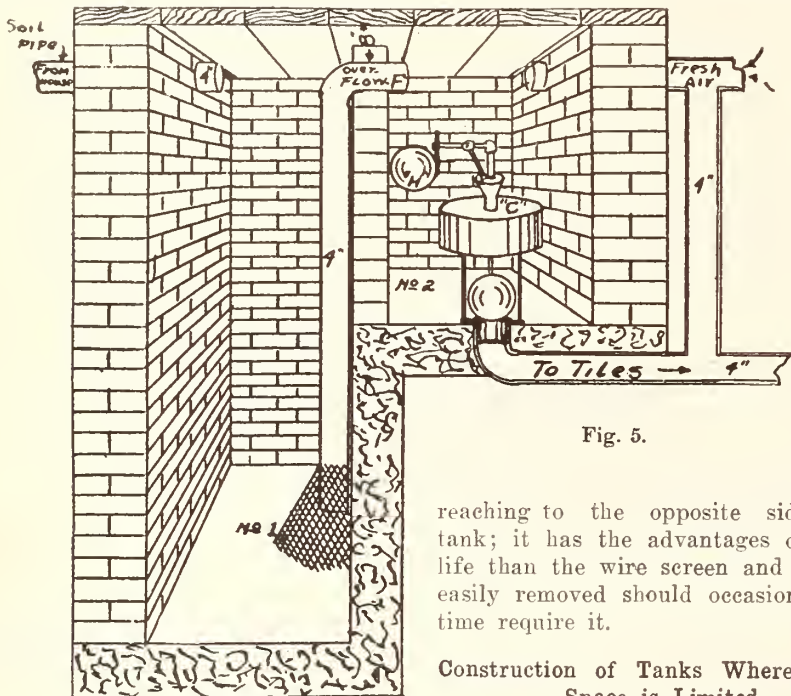


Fig. 5.

reaching to the opposite side of the tank; it has the advantages of longer life than the wire screen and of being easily removed should occasion at any time require it.

Construction of Tanks Where Ground Space is Limited.

In answer to a question which arises in the minds of most people who have given consideration to the system, I may say that it will not freeze in winter, even when the frost penetrates the ground for several feet, everywhere except where the tiles are laid, and, as may be expected, splendid results may be obtained in vegetables or flowers if the tiles are laid under a garden.

System Not Affected by Frost.

In conclusion I would simply refer to a few of the principal points which

is limited and it would prove difficult to install a tank of the proper cubical contents and a maximum depth of not more than three feet.

In such a case it is permissible to build compartment No. 1 as deep as five or six feet giving it the same cubical area as No. 2, which, however, in no case should exceed three feet in depth, such an arrangement is shown in Fig. 5, which also shows that the over-flow pipe is carried to a point as near the floor as it would be if the tank were shallower.

Removing, Replacing and Beading Boiler Tubes

Dealing With a Problem Which is of Great Interest to Heating Engineers, Particularly Those Situated in Towns Where There is no Boiler Works.

By H. Westwood.

IN a recent issue of Canadian Machinery J. Langridge wished to know "What is the usual procedure in removing, replacing and beading tubes in a return tubular boiler.

The manner of installing tubes does not differ materially with types of boilers. In removing a full set of tubes from a return tubular boiler, a start should be made from the bottom, being the tubes nearest the hand hole. The tube in the front head is cut off with a bar as shown in Fig. 1 while the bead is cut off the tube in the rear end with a hammer and flat chisel. The tube is then worked down and out of the hand hole in the front head.

In case one or just a few tubes are to be taken out the front end is usually split and the bead cut off on the back head. Then, by means of a sledge and special tool, the tube is knocked out of the tube sheet and removed. The ripper shown in Fig. 2 is used in splitting the tube, after which a slit is cut, extending back beyond the tube sheet an inch or two. This allows the tube to be closed in and removed through its own hole.

Scale Trouble.

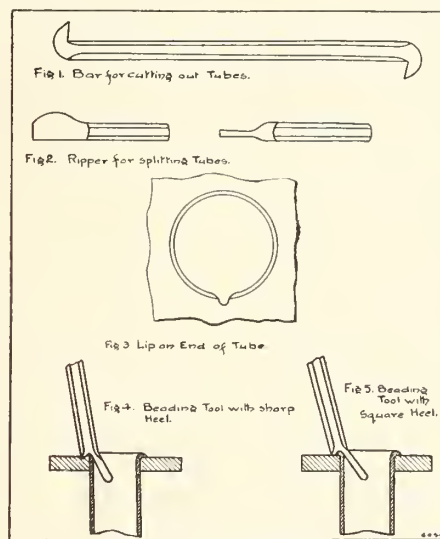
If scale adheres to the tubes to the extent that they cannot readily be removed in this manner then they must be removed through the hand hole. Should the latter not be in a convenient place, the hole in the tube sheet may be enlarged and the tube extracted through it. For this purpose it is necessary usually to enlarge the hole from $\frac{1}{8}$ to 3-16 of an inch, depending upon the amount of scale adhering. It should not, however, be enlarged more than necessary, as it must be reduced to nearly normal size when the new tube is put in. In some cases, especially with the locomotive type of boiler a copper ferrule is placed between the tubes and the sheets. This however, usually applies only to the sheets directly in contact with the flames and hot gases, although some manufacturers use a copper ferrule in both tube sheets.

The replacing of tubes in an old tube sheet must be done with the utmost care. The sheets should be carefully inspected and all scale removed from the inside surface around the hole. The edges of the holes should be chamfered leaving a good fillet to prevent the tube from being cut by sharp edges or burrs. Again, the holes are liable to be out of round, in which case they must be reamed.

In some types of boilers there is a marked tendency for the fire box sheets to expand more in a vertical than in a horizontal direction. This distorts the hole, the vertical diameter being slightly greater than the horizontal diameter. The holes at the centre of the tube sheet usually suffer most from this distortion.

Installing a Set of Tubes.

Before installing a set of tubes, attention should be given to the sheets to see if they are straight, and if not they should be straightened as far as possible.



BOILER TUBES.
REMOVING, REPLACING AND BEADING

ble. This is accomplished by means of bars and bolts. When the sheet has been straightened, a number of tubes, depending upon the size of the boiler, are temporarily fastened to both sheets to permit the removal of the straightening bars, after which the balance of the tubes can be inserted and the operation completed.

It is general practice, with tubes which are beaded at one end and the other end expanded only to cut them the desired length before inserting into the tube sheets. Some times there is more or less variation in the lengths of the tubes in which case the tube sheet is divided into sections, the tubes of each section being cut the same length. They are then marked for their respective sections, and when installed all will project from the sheet about the same distance.

If the tubes are to be beaded at both ends, then the measurements should be taken with more care, and the variation between the sections should not exceed

1-16 of an inch. Some boiler manufacturers design their boilers so as to use a special length of tube. All the tubes are usually about the right length and those that project too far beyond the sheets are cut off at the desired point by a special machine, although frequently a flat chisel and hammer is used. Tubes expanded into the sheet and not beaded should not extend beyond the sheet over 3-16 of an inch. Those which extend too far beyond the sheets not only prevent proper expansion but also permit the surplus part of the tube, which is not cooled by the water, to be burned or wasted away.

The Rolling Feature.

Tubes are tightened into the sheets by means of a roller or sectional expander. When the tube is inserted into the hole it should project beyond the sheets 3-16 to $\frac{1}{4}$ of an inch, which amount is allowed for the bead. The tube is held temporarily by lipping the tube with a hammer as indicated in Fig. 3. The lip will hold the tube in position while it is being expanded. Usually about four turns of the expander will force the tube out against the sheet. The use of a heavy maul for driving the mandril should be discouraged, as the blows struck upon the mandril should not be heavy enough to cause the tube sheet to warp or spring.

The tubes ought to be worked to the sheet, and if this is done properly the sheet will not be distorted. A large tapering pin should never be used to enlarge the tube. The copper ferrules are annealed before being put into place and must be a neat fit. If too small for the hole, they may be stretched and re-annealed. In expanding tubes with the roller expander, the mandril should be forced in only a short distance at a time, otherwise humps will form and make the rolling unsatisfactory.

In rolling leaky tubes, expand them very lightly and use an ordinary hammer on the mandril. It is not well to remember that heavy pounding is not required to tighten the tube in the sheet, as the tube has already the full contour of the expander. Beading the tube is very important. A beading tool constructed with a sharp heel is very liable to result in the sheet being cut when the bead is calked. In Fig. 4 is shown a beading tool having a sharp heel, also the manner in which it cuts the sheet, while Fig. 5 shows a beading tool with a square heel which prevents the cutting tendency.

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TORONTO, FEBRUARY 2, 1914

VERY ENCOURAGING NEWS.

ALL over Canada we hear of sanitary engineers being appointed upon our city and provincial Boards of Health. This is, to say the least, very encouraging news. It goes to show that the day is not far distant when sanitary engineers will begin to receive some credit for the good work they have been doing. When each city, town and village are compelled to have such a representative upon their boards of health better results will be accomplished. Several years ago the city councils had the impression that a second-rate medical practitioner was good enough to fill the position of medical health officer. Some cities have been content to let things slide into any condition, but almost every city in Canada to-day is looking for the best man they can find. The trouble is, they do not pay large enough salaries. We heard not long ago of a city of about 25,000 offering \$1,200 a year for a medical officer of health. Now let us say right here, such a salary is not enough. If a city required a man at the head of their health department, it should look for a man that can earn and save three times that amount. If he cannot command more than \$1,200, the chances are he'll be dear at that price.

A Thankless Position.

Such a position, in the first place, requires an expert medical practitioner. It also requires a man who is public-spirited, a man who is fearless and strong, and who is alive to everything new which takes place along lines of sanitation. It requires a man who cannot be bought over by any side, and who will assert the power vested in him as Medical Health Officer. Such a man will find he is holding a very thankless position, hence we assert that he should be well paid.

WATERWORKS ENGINEER ON BOARDS OF HEALTH.

ANOTHER engineer should be on our Board of Health, the one who is at the head of our water supply.

He too should be a practical man. He should be a man with all the fearlessness of character which is necessary in the make-up of our medical health officer. At this day every city in Canada is drinking more or less polluted water, and on the other hand some cities are threatened with some calamity such as the recent failure of water supply in Montreal. It is a disgrace to think that Montreal should be handled in such a slipshod manner, but who is to blame? The people, of course. Montreal, To-

ronto, Ottawa and several other cities have lost thousands of lives because of the pure apathy of the people. Men are put into positions which they cannot fill. They are kept in those positions because they are cheap. Then a catastrophe occurs such as happened recently in Ottawa, and more recently in Montreal, and the people get busy and, as it were, "lock the door when the horse is stolen."



POLLUTION OF WATER WILL BE CRIMINAL ACT.

A RECENT investigation by Professor Ravenal and E. J. Tully, of the water of Lake Michigan, confirms what has been found in Lake Ontario as to the connection between sewage discharged into the lake and the pollution of water supplies taken from the same source.

They find that the water intake of any city on Lake Michigan discharging sewage into the lake, and where the water supply is not filtered or treated, must be situated at least twelve miles from shore. As this is obviously impossible, the conclusion was arrived at that it is essential that the sewage of municipalities should be treated and the water supply filtered or sterilized also.

These are exactly the conditions arrived at from the investigations carried out in Lake Ontario at Toronto by the Laboratory Staff. Pollution was found beyond Scarborough Bluffs, three miles from shore on the east; three miles from shore off Toronto Island, and a mile off Mimico point on the west. If the lake were a perfectly still body of water there would be little danger, but since winds carry currents of sewage hither and thither there is only one alternative left, namely, the treatment of both sewage and water. As Professor Ravenal concludes: "In any case, it seems that cities should cease the pollution of the lake by dumping of their sewage into it."

We believe that the pollution of the Great Lakes will soon be made a criminal offence by the Dominion House.



HEATING SYSTEMS SHOULD BE SANITARY.

NOW that so many cities have felt the need of appointing sanitary engineers on their Boards of Health, let us hope the one appointed will also be a heating and ventilating engineer.

Heating and ventilation is just as sanitary a measure as the proper disposal of our sewage. How many lives have been lost as a result of poor heating systems and no ventilation? We venture to say that no record could be arrived

at, and it is almost as well, for we do know such a record would be appalling.

If a residence, factory, office or workshop is badly heated, and no proper system of ventilation is provided, what is going to be the result? The occupants of a home are apt to contract colds more as a result of poor ventilation than any other source. Houses are closed up so tight because of inefficient heat, and on the other hand having no laws governing either heating or ventilation, even when a house is well heated, there is no ventilating system provided. Hence one is as bad as the other.



MORE PROGRESS IN OFFICES, FACTORIES, ETC.

U being provided by owners of large buildings used as offices, factories and workshops, for the simple reason that such measures as good heating and ventilation result in a greater output. Clerks in ventilated offices can accomplish more than when they are working in buildings that are poorly heated and ventilated. Factories and workshops are spending more money in such improvements and are getting splendid results. We had a case brought to our notice where a firm put up a modern building, the best and most serviceable sanitary appliances, a modern system of heating and ventilation, and, on completion, simply moved their same plant and staff in the new building. When all got working, it was found that the staff were more efficient, all wearied looks had disappeared, and a greater amount of work was being and is being done, than ever before.



EDITORIAL COMMENTS.

Practical experience is the germ of power.

* * *

To make mistakes is human; to profit by them is divine.

* * *

We learn how to use a hammer best, by hitting the wrong nail.

* * *

Millionaires cannot buy the education which has been acquired in the school of hard knocks.

* * *

When in doubt, proceed cautiously. But proceed—don't hang back and let doubts spoil action.

* * *

Elbert Hubbard once said: "The man who never made a mistake never made anything else worth a damn."

* * *

Such sayings can be applied all along the line. For instance: The man who never burnt his hands never learned to wipe a good joint.

* * *

Speaking of ventilation, a man has lived 40 days without food, but he couldn't have lived four minutes without air. Then is it wise to build homes and pollute that air by lack of proper ventilation?

* * *

The adage, "When in doubt, don't do it," should be stricken from the records of wise sayings. In fact, it should never have been classed as such. It teaches the treason of inactivity, it instils that feeling of "let-well-enough-alone."

The Business Outlook

IT will perhaps be in order to briefly review some figures relating to the year 1913—figures which go far to prove that conditions were not so bad for all and, what is more to the point, which point with unmistakable directness to the bright prospects ahead.

"The financial stringency," says a writer in a current periodical, "appears to be preparing for departure." He is not over-stating the facts. The stringency has gone. Money has "eased up" very considerably. The prices of securities are going up. There is a more generally active tone on the money market and even the stock exchanges are beginning to show signs of activity, a sure sign of a more free circulation of the medium of barter. And business is showing the same hopeful signs. An improvement, slow but sure, has set in. By the middle of the summer, business will be headed toward a new plane of activity.

A few figures will demonstrate how fundamentally sound conditions were under 1913. Dairy products of the prairie provinces brought in about \$5,000,000, or nearly \$2,000,000 more than in 1912. Live stock in the same section approximated \$23,000,000, or an increase of nearly \$8,000,000 over the preceding year.

The output of the iron and steel trades showed an increase of 10%. The earnings of the railways showed advances ranging from 4½% to 12½%—a significant indication of national growth. Canada's cereal milling capacity increased to 121,000 barrels per day, which is about 10,000 barrels more than the 1912 capacity.

Approximately speaking, Canada's external trade was \$200,000,000 greater during 1913 than for the preceding year and this, so the statisticians tell us, is the greatest increase in any one year in the history of the Dominion.

A few other facts will serve to prove the fact that 1913, though a year of uncertainty and of hampering financial tightness, was nevertheless a year of industrial activity. Some 4,000 miles of new track was laid. The population increased by nearly half a million, the immigration figures showing a total influx of 48,812 during the year. The crop figures showed very large increases. Building permits were large in most centres. Bank clearings were large. In Winnipeg alone they reached a total of \$1,634,977,237.

The present year is opening with splendid promise. The gradual improvement in conditions, which was predicted, is being felt. Each week sees a brightening of the business horizon and a larger volume of trade. That this gradual process of development will continue for several months is the general belief; and after that, there will be no limit to the measure of the prosperity that will be felt.

From the standpoint of the grocery and allied trades, business prospects continue bright. Wholesalers in provisions, fruits and fish and millers are invariably inclined to take a more hopeful view and there appears to be every reason for an average winter and a good spring trade. The majority of the large food-stuff manufacturers certainly had a good year in 1913, despite the fact that many retailers adopted a policy of retrenchment from a buying standpoint, preferring to get rid of the stocks on hand rather than add greatly to them. Now, however, these dealers are in the market again, and it is probably this that accounts mostly for the extent of the passing trade.

Analysis of Canadian Sanitary Engineering Bylaws

In This Issue We Are Again Taking up By-law No. 1531, Now in Force in the City of Calgary — Comments on This By-law is Concluded in This Issue.

In this issue we propose concluding the comments on this by-law, and before doing so, we would ask our readers to note from time to time, the completeness of each clause as a whole. They are all very clear and definite. We regret such is not the case in too many of our by-laws, though we feel the time is not far distant when a Dominion code will be in force and when each and every village, town or city will have some ordinances in force which will at least be general as well as rigid enough to insure better sanitary engineering in all places. We will reproduce the next clause following the one commented upon in our last issue, viz:

CLAUSE 42.

Sub-soil drains should discharge into a sump or receiving tank, the contents of which if discharged by gravity may discharge behind the trap of a ram-water leader or area-drain, or through a properly trapped and vented water-supplied receptacle.

Note how clear this clause is. No one could misunderstand it if they understood the trade.

CLAUSE 43.

Where mechanical force is required to discharge the contents into the plumbing and drainage system, a proper cut-off or check valve must be provided on connection between the house drain and apparatus used for raising the contents of sump-pit.

CLAUSE 44.

This is a comparatively new clause on account of the very nature of the question it involves: viz. the vacuum cleaner and the proper disposal of dirt and dust picked up by it, and reads as follows:

Clause 44.—The contents of settling chamber or dust receptacle for vacuum cleaners may be discharged into a plumbing system, the same sub-soil drain sump-pit.

CLAUSE 45.

This clause is pretty general and deals with the kind of pipe which shall or shall not be used for rain water leaders: for instance, all leaders inside a building must be of medium cast iron, galvanized, wrought iron or steel pipe, while out-

side leaders may be made of galvanized sheet metal.

There is a paragraph which states that no rain water leader can be used for soil washes of any kind or under any condition.

CLAUSE 46.

This clause is rather an important one which should be embodied in every city by-law. It deals with the size of house drains necessary to carry away the discharge from rain-water leaders. We reproduce it herewith:

The house drain must be at least four inches (4) in diameter, and when receiving the discharge of rain leaders, the size shall be computed according to the square feet area drained into them.

The following table is the maximum area allowed to drain into pipes of given diameter:

Diameter	Sq. Ft. in Area
4 inches	2,500
5 "	4,500
6 "	2,000
8 "	18,000
10 "	40,000
12 "	70,000

CLAUSE 47.

This is a very general clause and is to be found in almost every by-law and refers to the minimum size of waste or soil pipes to be used where water closets discharge into them; viz. 4 inches. It also states there shall be no less than one-quarter of an inch fall to every foot of horizontal run.

CLAUSE 48.

This is one of rather more importance and states clearly that all changes in direction shall be made with curved pipes and at least one clean-out length shall be provided at each change of direction.

It is to be hoped this clause is strictly enforced, because many a run of drain pipe, both tile and cast iron soil pipe has been found to leak on account of some being installed with a kink in them, which means that it is next to impossible to make a good sound joint unless the metal is run evenly round the inside of hub.

CLAUSE 49.

This is a simple clause but means much in some towns. We reprint it in full:

In dwellings where there is no cellar or basement, there shall be an excavation made at least four (4) feet square, with sides sheeted with two-ply lumber and made tight, in which shall be placed a clean-out fitting on house drain as shall be designated by the plumbing department. A hatch shall be left in floor for access at all times.

All pipes underground must be of cast-iron. The distance between clean-outs on any length of horizontal run of pipe shall not exceed thirty feet.

Here is a clause which distinctly states **NO TILE PIPE WILL BE ALLOWED UNDER DWELLINGS.**

Calgary is to be credited as being one of the Canadian cities which cannot be played upon by those who do not take matters of sanitation to heart as they should. In looking over the Canadian city by-laws we regret to state that tile pipe is **even permitted** in cities which ought to know better, though we know that none are so blind as those who refuse to see.

CLAUSE 50.

This is a good but general clause and simply states that where a drain pipe passes under the walls of a building, an arch must be built so as to protect the said pipe from being damaged by any settling or heaving of the building.

CLAUSE 51.

This is a general clause and simply states that where drains are above floor they must be well supported every ten feet.

CLAUSE 52.

This clause is to be commended and should be embodied in all sanitary by-laws. It deals with the question as to how exhaust steam or blow-off outlets from steam boilers shall be connected to drainage systems. It is complete and speaks for itself, though to the person who does not understand the reason why such care need be taken, we would say that it is the duty of the sanitary engineer to explain in a simple and definite way why such precaution is necessary. No doubt if greater care were taken with

our drainage systems by insisting that only soil or waste that is not liable to deteriorate or endanger the life of the systems should be allowed to be poured down them we would have a less number of them choking up.

MATTER OF EDUCATION.

We feel, however, that as a whole, the craft are a little backward in explaining the need for some of the precautions which are really necessary. For instance, the writer has a case in mind where several sanitary engineers were called upon to install a new sink in a kitchen. The city where this occurred, like all other cities, had men in the trade who were good, bad and indifferent. The first man to be asked for a tender on it was one we would define as being in the 'indifferent' class.

The price was given; viz., \$35.00. The next was called upon (of the "bad" class) and gave a price of \$25.00. The third was called upon, saw what was wanted and quoted a price of \$32.50. This is an actual fact. Now the owner, of course, remarked that he had had a much lower price quoted, and thought there was some "hold-up" game being played upon him, so he went to the lowest tenderer and gave him the job. This is what happened: The \$25.00 man put in an 18x30 roll-rimmed sink, a pair of nickel-plated 1/2-inch sink cocks and a nickel-plated 1/2 S trap. (No vent). The job worked O.K. as far as could be seen, but the law, which distinctly stated that all traps should be back-vented, was not carried out.

The other two who tendered got sore and afterwards put the matter up to the owner, showing where this cheap Jack had actually made more money out of the job than they would have done at the price they quoted. Now, why was this not pointed out to the owner at first? Further, a copy of the by-law could have been shown him and a small educational campaign would have been started in an individual way? But we are too apt to resent the opinion that the public have of us, instead of taking an honest, open stand, showing how, as a whole, the craft have the public welfare at heart. We will now pass on to reproduce Clause 52:

No steam or boiler blow-off shall be directly connected with the house drain. Such pipes must first discharge into a proper condensing tank and cooling pit, and from this a properly trapped outlet connected to the house sewer.

The following clauses are so general as need no commenting upon except that such should be in all city by-laws:

Clause 53. Soil and waste lines.

Clause 54. Distance through roof.

Clause 54A. Offset on soil and waste.

Clause 55. Clean-out on waste.

Clause 56. Clean-out on base of stacks.

Clause 57. Exposed waste lines.

CLAUSE 58.

This clause is one of great importance and is well worth while some consideration. We here reproduce it, word for word:

The diameter of soil pipes must not be less than those given in the following tables:

Four-inch piping—1 to 6 floors, maximum number of W.C.'s 25; no more than 15 W.C.'s to be installed above the 4th floor. If more than aforesaid 15 W.C.'s installed above 4th floor, soil pipe to be 5 inches.

Five-inch piping—7 to 10 floors, maximum number of W.C.'s 60; not more than 40 to be installed above 5th floor.

If more than aforesaid 40 W.C.'s are installed above 8th floor, soil pipe to be 6 inches. Above 10 floors special permit.

It will be seen by our readers that the aforementioned portion of this clause deals only with the soil pipe stack where W.C.'s are connected to stack. The following is the second part of same clause and deals with stacks used to carry away the waste from sinks and baths and reads as follows:

Main waste stacks for kitchen sinks, 2 to 4 floors; 1 or 2 sinks on each floor. **2 inches.**

Main waste stacks for kitchen sinks, 5 to 8 floors; 3 or 4 sinks to each floor. **3 inches.**

Main waste stacks for kitchen sinks, 8 floors and upwards. **4 inches.**

FOR BATHS.

Main waste stacks for baths, 1 to 3 floors, 1 to 2 fixtures. **1 1/2 inches.**

Main waste stacks for baths, 3 to 5 floors, 3 to 5 fixtures. **2 inches.**

Main waste stacks for baths, 5 to 10 floors. **3 inches.**

Main waste stacks for baths over 10 floors. **4 inches.**

CLAUSE 59.

This clause is general and reads as follows:

All traps must be protected from syphonage and back pressure, and the drainage system ventilated by special lines of vent pipes.

This clause which in itself is general, has a rather misleading tendency. For instance, the last sentence would lead one to think that, in addition to the main soil pipe stack, which in houses of 2 or 3 bathrooms, acts as vent to the

whole system it would also be necessary to insert a separate vent for the drainage system. Such a clause would be better demonstrated by a drawing, showing under what circumstances it would be necessary to run a special vent line.

CLAUSE 60.

This clause refers to the construction of offsets on vent lines, etc., the larger portion of the clause is all that can be desired, but we feel in one particular it is rather indefinite. We refer to the word "May," in the first sentence. We should prefer the word "Must."

The clause reads as follows:

All offsets may, where possible, be made at an angle of not less than forty-five degrees to the horizontal. All main vent lines must be connected at the bottom with a soil or waste pipe by a Y branch and be of full diameter throughout its entire length. Branch vent pipes shall be kept above the top of all connecting fixtures and not less than (4) four inches nor more than (18) eighteen inches from crown of trap or side of lead bend.

No sheet metal, brick or other flue shall be used as a vent pipe.

CLAUSE 61.

Deals with size of vents showing that the size of vent pipes throughout its entire length must not be less than the following:

FOR PRIVATE RESIDENCES.

For water closets on stacks not over two storeys in height, and not over three W.C.'s. **2 inches.**

For Other Buildings.

Stacks from 2 to 4 storeys high, not over 2 W.C.'s on each floor. **3 inches.**

Stacks from 5 to 8 storeys high not over 4 W.C.'s on each floor. **4 inches.**

Stacks from 8 to 10 storeys high, not over 6 W.C.'s on each floor. **5 inches.**

For Fixtures Other Than W.C.'s or Slop

Sinks.

1 to 4 fixtures; 1 to 2 floors. **1 1/2 inches.**

4 to 14 fixtures, 3 to 8 floors. **2 inches.**

14 fixtures and upwards, 8 floors and upwards. **3 inches.**

CLAUSE 62.

This clause could be very well demonstrated by a plan, and is one which, if a little more elastic would work no ill to the trade or to the scientific laws on sanitation. For instance, it may be required to install 7 W.C.'s, and in that case, providing the length of waste was not too long, or the main vent line not

too high, no harm would be done by allowing seven to be installed without the increased size of pipes being enforced. It may, however, cause an owner to install only 6 W.C.'s in place of 7. One thing we must not forget and that is, every city should have a first-class mechanic at the head of their inspection department, a man with strength of character too, who could be trusted to decide fairly, when to deviate from the by-laws and be fair to all concerned, and at the same time keep a record of, and the reason for, any such changes. In fact, it would be well to issue a special permit.

Clause 62.—Batteries of not over six (6) water closets may be run on a loop or circuit vent system, but such circuit or loop shall be of full diameter of waste line.

CLAUSE 63.

Refers to the venting of fixtures when arranged in groups or batteries.

When the plumbing fixtures installed in any building are arranged in groups or batteries, and the number of the branch vents from the traps of fixtures connecting to any main branch vent exceeds the number and size given in the following table, a 3 inch main branch vent must be provided.

2—1½ inch branches on 1½-inch main branch.

2—2 inch branches on a 2-inch main branch.

6—1½ inch branches on a 2-inch main branch.

2—2 inch branches on a 2-inch main branch.

2—1½ inch branches on a 2-inch main branch.

1—2 inch branches on a 2-inch main branch.

4—1½ inch branches on a 2-inch main branch.

For a long horizontal branch vent pipe over 15 feet in length, but not over 25 feet, 2 inches in diameter.

25 ft. to 50 ft.—2½ inch diameter.

35 ft. to 50 ft.—3 inch diameter.

No branch vent pipe can exceed 50 feet in length, nor can any main vent be less diameter than the largest branch vent connecting to same.

No trap shall have a vent less than one size smaller than the trap which it serves and in no case less than 1¼ inches.

CLAUSE 64.

This clause takes up the question of traps showing that every fixture must be separately trapped by a water-sealing trap, except that 3 wash trays in battery may empty into one trap and all such fixtures shall be proved with strainers or cross-bars over the openings.

CLAUSE 65.

Deals with leader, area or floor traps, which must be 3 inches in diameter and have not less than a 3½-inch water seal.

It also deals with dental cuspidor traps in a general way.

CLAUSE 66.

This is a very general clause and deals with safe and refrigerator wastes; it is embodied in almost every city by-law.

Safe and refrigerator waste pipes must be trapped and discharged over a properly water supplied, trapped and vented sink, publicly placed and in no case over a sink located in a room used for living purposes.

CLAUSE 67.

This is important enough to reproduce and deals with fixtures which may or may not be fitted up with indirect waste and may easily have been treated under Clause 66, which is really an indirect waste, even though the refrigerator is separately trapped.

No plumbing fixtures, except bar sinks or soda water fountains or drinking fountains, shall be installed with an indirect waste, connections to the plumbing and drainage system. If not directly connected, must discharge over a properly water sealed trap or vented sink.

Drinking fountains must be trapped and the waste line extended through the roof. No vent connection need be provided if not directly connected.

This clause might be a little clearer in many ways. In the first place it excepts bar fixtures, soda fountains, and drinking fountains. Then further on it states "Drinking fountains must be trapped and the waste line extended through the roof." Now the fact of the waste line being necessary to be extended through the roof at once makes that waste pipe a vent, the moment it leaves the highest fountain.

This clause then goes on to state: "No vent connections need to be provided if not directly connected." A clause such as this would be better demonstrated with a plan or drawing, showing just what would, or would not be allowed.

CLAUSE 68.

Grease traps of sufficient size and having water-cooled jackets shall be placed on the waste pipes from sinks, in hotels, restaurants and such other places as the inspector may direct.

No doubt this is a commendable clause and will prevent drain and waste pipes from being blocked to the extent that they are, when such traps are not in use.

CLAUSE 69.

Pedestal basins in barber shops may be connected with approved anti-syphon traps in positions where venting is not possible.

This is a clause which is embodied in several by-laws, or in some cases the matter is left to the judgment of the plumbing inspector. It is a clause which comes in for a lot of adverse criticism, and rightly so.

For instance, why should a pedestal fixture be more favored than any other basin? Let us cite one of many instances.

Not very long ago a gentleman wished to install a lavatory in an office which he had taken for a period of 5 years. It was situated on the ground floor and there were 6 storeys above him. He was told that he could not install the lavatory unless it was back-vented, etc., which was out of the question. Not long after he was in a barber's shop and saw a pedestal basin fitted up with a mercury vent, and at once took the matter up; but was again informed that the by-law said so and so, and he would have to simply either follow out the law or do without a basin, which to say the least was not a fair decision, and to the thinking public seems to be a pure "hold-up." Here is a chance to remedy matters by dealing fairly with the public in an unbiased manner.

CLAUSE 70.

This clause deals with the minimum number of sanitary fixtures which must be put into buildings of various natures.

Further, it states that under any condition no less than one W.C. must be provided for every 15 persons.

In apartment houses a W.C. must be provided to each suite of rooms.

CLAUSE 71.

reads as follows:

Separate water closets and toilet rooms must be provided for each sex on each floor in buildings used as workshops, rooming houses, office buildings, factories, hotels and all other places of public assembly.

This is a particularly good clause and one which should in all decency be embodied in the plumbing by-law of every city, particularly the paragraph which calls for rooming houses being equipped with lavatory and toilet conveniences. It is a matter which should be looked into by several Canadian cities, where large residences are being rented for rooming purposes.

CLAUSE 72.

In apartment houses, rooming houses, factories, workshops, and all public buildings, the entire water closet apartment and side walls to a height of 6 feet from the floor.

except at doorways, must be made waterproof with asphalt, cement, tile, or waterproof material as approved by the plumbing department.

This is an excellent clause and one which would also be well to enforce in every city. It is also very desirable that it should be enforced in all bathrooms or W.C. apartments. It would mean more sanitary bathrooms, etc., and if such a clause is found to be merely a sanitary measure for a public building, why not in a home?

The bathroom and W.C. is a part of the house where most dampness prevails. It also is a room where most wear and tear is felt, and it should be the best provided for by way of being substantial and lasting.

Many a portion of the home could be cheapened rather than let the bathroom equipment suffer. Apart from the hard wear it has to stand, such an equipment has an educational influence upon those who use it.

CLAUSE 73.

This clause demands that all W.C. and urinal apartments shall be connected with the outside air.

CLAUSE 74.

Calls for back water valves to be placed on all soil pipe drains in connection with W.C.'s when these have to be placed in a basement.

CLAUSE 75.

In all buildings occupied as lodging or boarding houses, hotels, offices, workshops or factories, there must be at least one slop sink for each floor, placed so as to be accessible at all times.

CLAUSES 76-77-78-79 and 80.

deals with the following subjects:

Separate apartments for W.C.'s; separate flush tanks or flushometers to each fixture; Flushometers; trough W.C. and similar appliances, urinals—and what kinds will not be allowed, also the prohibiting of wooden sinks, etc.

CLAUSE 81.

Demands extra heavy lead or earthenware pipes for acid waste which must terminate with a specially constructed box or tank.

CLAUSES 82-83-84-85-86 and 87.

deals with sewage lifts; water supplies; depth of water pipes; exposed water pipes; valves on supplies; and demands that names of manufacturer shall be on all stop and waste cocks, bibbs or other appliances for the control of water—and tests needed for the finished work.

CLAUSE 88.

This clause makes it plain that when work has been reported ready for test inspection, and is found defective, an

extra charge of 50 cents will be made on all further inspections, etc.

CLAUSE 89.

This is a good clause and if enforced to the letter in every city would soon return compound interest by way of better and more healthy conditions. It is regrettable to see the number of unsanitary equipments which are in use all over this fair Canada of ours. A young country such as this, should, above all, be almost free from such unsanitary places. This clause reads as follows:

The plumbing inspector shall have the power to examine all buildings as to the plumbing, drainage and ventilation thereof, and when in his judgment the plumbing fixtures are found to be defective or unsanitary, he shall have the power to order their removal or repair, or substitute other fixtures, and to require the ventilation and drainage of each building to be placed in a sanitary condition, and shall give the agent, owner or tenant occupying any building or premises notice in writing specifying the time when any defective drain, sewer connection or unsanitary fixture must be completed.

It may be added that, if Clause 88 gave the plumbing inspector power to placard the building as unsanitary and not fit for human habitation, if such improvements were not made within the time stated, it would be a power for good, and bring property owners to time better than anything else we know of, as it often pays to pay fines from time to time.

CLAUSE 90.

This is the last clause of this remarkable by-law, and states the penalty which any person will be liable to if not complying to the by-law or any part thereof, limiting it to or up to \$40 or imprisonment, etc.

In conclusion we must say that Calgary can claim to have a fairly complete by-law and hope that as the science of good sanitation progresses, this may be kept up-to-date by amendments or cancellation of clauses from time to time thus keeping the city from ever having an out-of-date law governing sanitary engineering.



A BOY'S REMARKS TO HIS STOMACH.

What's the matter with you—ain't I always been your friend?
Ain't I been a pardner to you? All my pennies don't I spend
In getting nice things for you? Don't I give you lots of cake?
Say, stummick, what's the matter, that you had to go and ache?

Why, I loaded you with good things yesterday; I gave you more Potatoes, squash and turkey than you'd ever had before!

I gave you nuts and candy, pumpkin pie and chocolate cake—

And last night when I got to bed you had to go and ache!

Say, what's the matter with you? Ain't you satisfied at all?

I gave you all you wanted; you was hard just like a ball;

And you couldn't hold another bit of puddin', yet last night

You ached mos' awful, stummick; that ain't treatin' me just right!

I've been a friend to you, I have; why ain't you a friend of mine?

They gave me castor oil last night because you made me whine.

I'm awful sick this mornin', and I'm feeling mighty blue,

Becco you don't appreciate the things I do for you!

Comment.—This boy is only doing what the public are doing every day. They put in fine bathroom and kitchen fixtures; they equip their kitchen with a fine roll rimmed sink and slop sink. Then pour everything in the way of dirty grease, tea leaves, and then to clean out a slop sink they will use lye to clear it. Then they murmur at having to call in a sanitary engineer to clear the pipes, and wonder why they choke up.

Some time ago the writer found 15 feet of 2-inch cast iron soil pipe choked with soap. How do you think it happened? Well, simply because the house-keeper had put lye down, and the pipe passed through a vegetable cellar, and it was generally very cold, hence the grease chilled on the inside walls of the pipe. Then the lye turned layer upon layer into a thin coat of soap.

MORAL.—Teach your customers how to take care of the intestines of the home.



Better late than never, but better never late.

• • •

Live within your means. A gentleman should have more in his pocket than on his back.

• • •

Salaries depend on what one does do; not what he is going to do. In other words, you must catch the bear before you sell his skin.

• • •

Benjamin Franklin once said that by observing and planning before you come to a definite decision you will be better prepared to meet and overcome any obstacle that may confront you.

Heating and Ventilation Past, Present and Future

These Articles Will Take up the Simplest Methods Adopted in the Past, the Present and the Possible Methods for the Future, and Will be Written as Free From Technical Phraseology as Possible, so as to be Within the Scope of the Lay Mind.

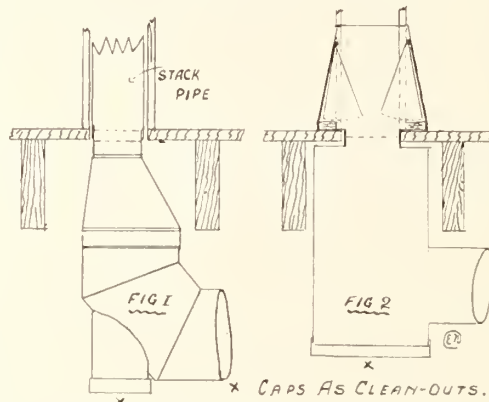
Second Article.

In our last issue we took up the first instalment of this subject, in which we dealt with the various forms of heating adopted—viz., log fires, open grates, stoves and warm air furnaces.

Before going into the matter of different forms of heating which are being adopted, we will continue further with the problem of hot air, or, as we stated in our previous article, warm air methods. No doubt there is a great deal of room for improvement, not so particularly in the furnaces themselves as with the need for better judgment in the installation of them.

For instance, in our opinion, all cold air ducts and warm air outlets should be placed in the baseboards, rather than in the floors. There should also be a tight-fitting cap placed at the foot of every header or register box, as shown in Figs. 1 and 2. Such method would enable the housewife or caretaker to clean the dust which falls into these pipes from time to time. Just this very week the writer had a very narrow escape of having his home burned down. A down draft had been created, which had carried a quantity of fluff and bits of paper which had accumulated at the foot of a stack pipe to the furnace, and set fire to it. Had the family been out or retired for the night, the results would have been disastrous. One cannot fail to note how, in many minds, the warm air furnace is not so popular as it would be if, as we said before, it were better installed.

Another feature which would lend popularity to this style of furnace is better constructed casings. At present most casings are made up of 26-gauge galvanized iron lined with a very thin sheet of asbestos paper and an inner eas-



ing of tin-plate, and in nine cases out of ten more heat is lost in the cellar or basement than is to be got up in the rooms, where the heat is most wanted. Now, we would certainly think that any heating engineer who wished to specialize on the installing of this kind of furnace would very soon make good by adopting a better make of casing than that mentioned.

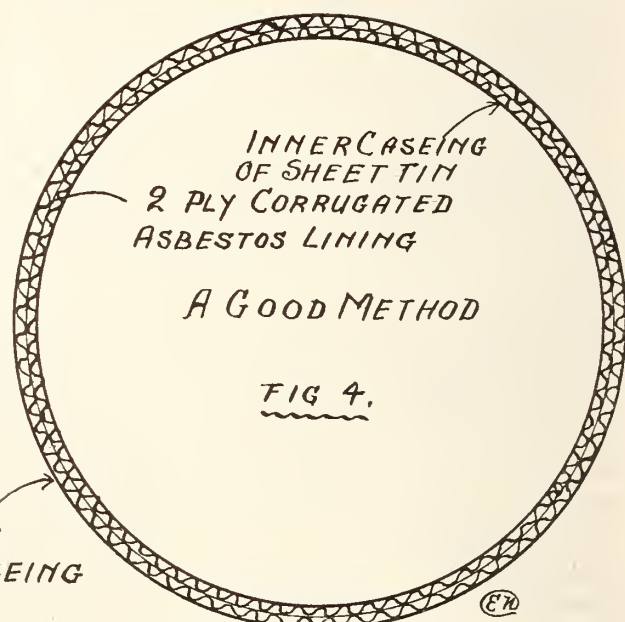
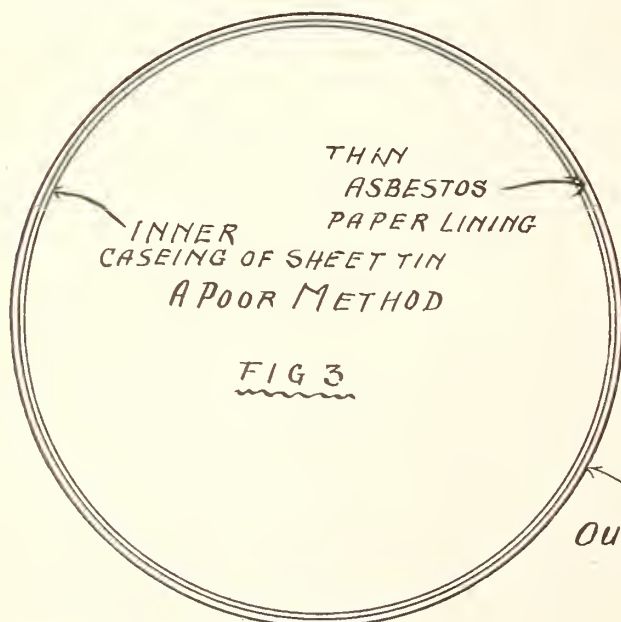
He would, of course, have to show his prospective customer the difference between his product and the one commonly in use. He would have to demonstrate how he could conserve the heat, etc., by making a good style of furnace casing.

Figs. 3 and 4 are line sketches of the common method and of a good method.

Then another source of loss of heat is the pipes. These, too, should be better constructed. They are simply tin pipes, sometimes, though very seldom, covered with asbestos, and then only with a very thin quantity pasted on to the pipes.

Such a method is not only a pure waste of time and material, but it also gives little or no results. For instance, suppose a person called in a heating engineer and asked him to put the same kind of asbestos paper on the mains of a hot water or steam furnace; what would be the reply? He would naturally say such material was very little use for such a purpose. Then, why in the name of common sense do these men who install hot air furnaces cover the pipes with such thin stuff?

Another argument in favor of better covering of warm air pipes is this: In an ordinary house of, say, 6 to 10 rooms, with two to three floors, the cellar or basement which is occupied by the furnace is generally from 20 to 30 per cent. of the total area of the house, and these cellars or basements are often found to be the warmest portion in the building. Why? Simply because of there being more heat diffused in this portion, owing to the furnace casing and pipes not being properly covered. In many cases smaller pipes could be used, less fuel could be burned, the basement would be



cooler, and better satisfaction would be obtained all along the line, if only the pipes and casing of the furnace were properly covered.

The writer has made many a furnace give splendid results by following such a course. When asked recently how the elbows were covered with this corrugated material, the method adopted was to take the tin pattern of the elbow and cut the material the same size and wire it on. The same with the pipes. Two wires are sufficient, as the material is stiff enough, and does not require paste.

Cold Air Ducts.

Another thing to be guarded against when installing a warm air furnace is to avoid having the cold air ducts too small, and they should never be less than

the furnace. It should be in such a position as to evaporate the largest volume of water without creating steam.

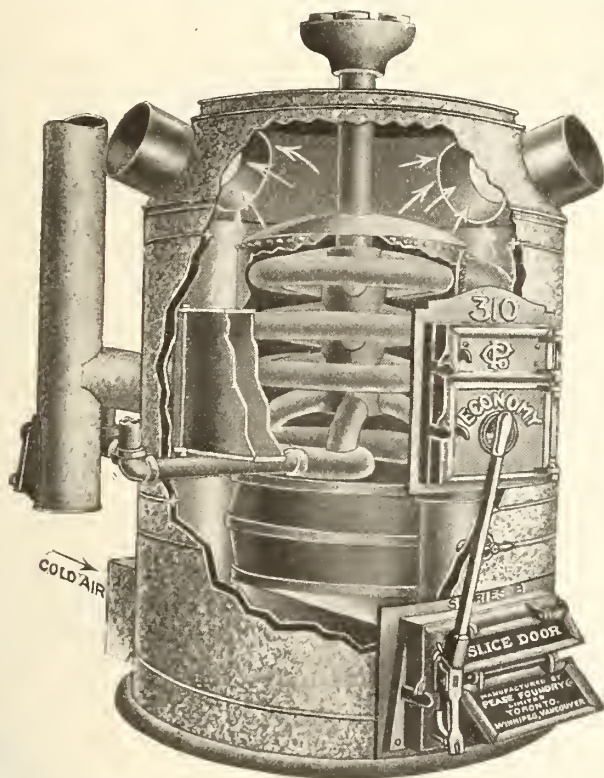
Various Styles of Water Pan.

These pans are made in various shapes. Some are made to fit all around the inside of the casing, and some are fitted with an automatic valve, similar to those used in a w.c. tank, so as to dispense with the constant attention required to fill them up.

A very simple method is to have a tap close to the top so as to turn it on and fill the pan easily. No doubt one of the greatest objections to the hot air furnace is that the filling of the pan is forgotten, thus causing the air to be dry. Another objection is that the heating is affected by a change in the direction of the wind. This objection may be overcome to a

at a great distance from the furnace, which, if the rooms were warmed by air,

Care must be taken that too much hot water heating surface is not placed in the furnace, as this will decrease the capacity of the warm air portion. A



Illustrations by the kind courtesy of the Pease Foundry Co., Ltd., Toronto.

two in number. The area of these ducts should be sufficiently large to fill all the warm air pipes, because if they are too small, lack of circulation will result, and the shortest pipes will get all the heat, or the warm air will be confined to a great extent in the casing of the furnace. This, too, will cause the cellar to become overheated. Then a good supply of water should always be maintained in some kind of water pan.

Some authorities favor these pans being situated above the level of the firepot; some on a level, and others favor them being at the lower portion of the furnace.

However, the proper position is more easily defined according to the make of

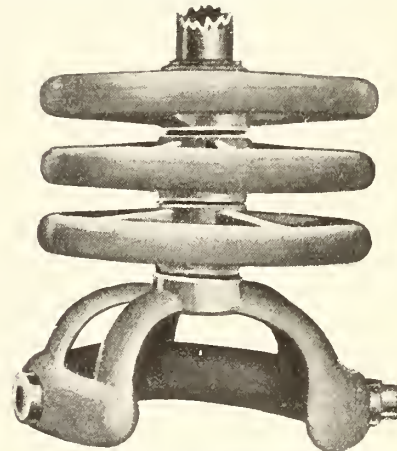
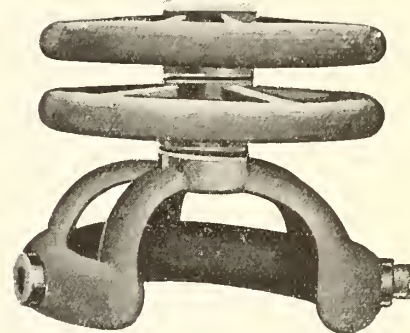
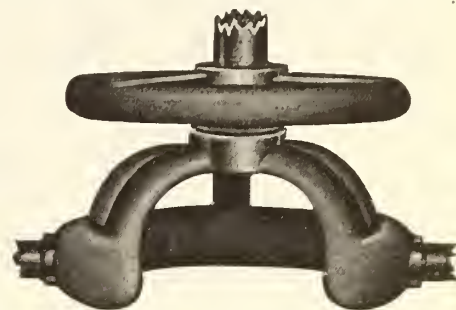
great extent if, when the furnace is being installed, it is placed nearest the side of the house which is likely to be most affected by such winds.

There is also another alternative which can be adopted—viz., the use of a combination furnace, by placing some approved auxiliary heater into the firebox. Almost every manufacturer of hot air furnaces can also supply suitable hot water appliances, which are specially adapted to their own particular furnace. By the use of these hot water attachments better results can frequently be got, especially where rooms are located would likely not give as good results as would be the case if an auxiliary hot water radiator were used.

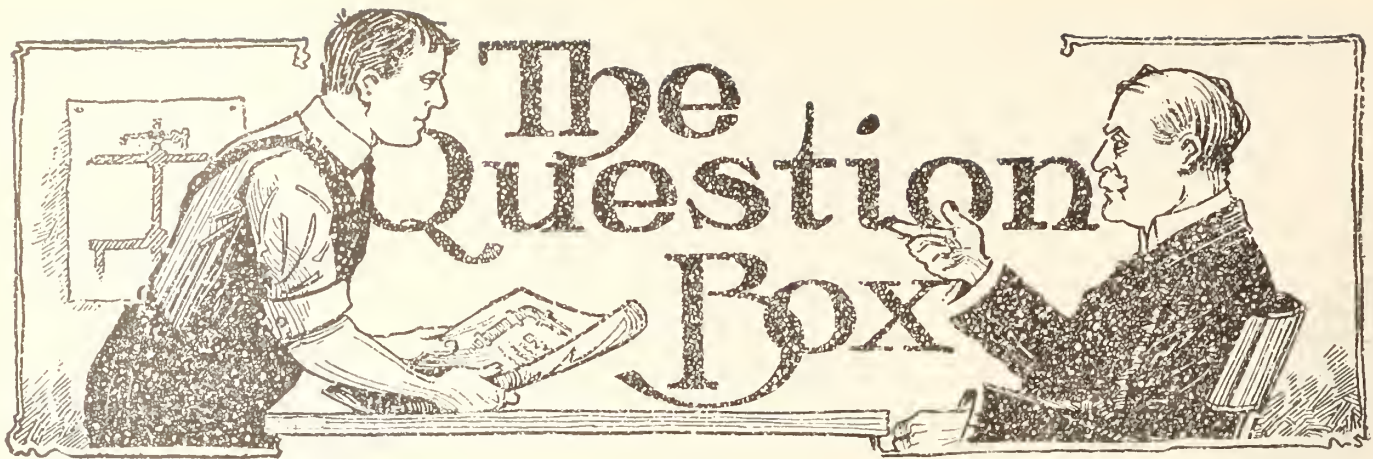
safe rule to observe is to find out what amount of radiation is required and provide for it as follows:—

To every square foot of surface actually merged in the fire, 35 to 45 square feet of radiation can be connected, and for each square foot suspended over the

fire and not touching it, from 15 to 25 square feet of radiation can be taken off. In every case these mains and returns should have no less than 2 inches in 10 feet of a pitch upward from the furnace, and same on returning downward. These pipes should also be covered with a good



class of pipe covering, otherwise in many cases a large percentage of the heating surface is taken up with mains. The same principles of installation must be carried out as would be considered when installing a complete hot water heating system and an expansion tank used in the same way.



Subscribers Are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks Are Also Invited.

BOILING POINT OF WATER.

Editor Sanitary Engineer.—Some time ago you stated in an article that water boiled under a vacuum at 98 degrees, whereas, I understand that water boils in an open vessel or under atmospheric pressure at 212 degrees. If as you say water boils under a vacuum at 98 degrees, what temperature is the result.

A Constant Reader.

* * *

Replying to A Constant Reader, we beg to inform him, that, as water boils under vacuum at 98 degrees the resultant vapor would of course be the same temperature, and while speaking on this subject let us state that water does not always boil at 212 degrees. It does however, at sea level, the higher above sea level, the lower temperature will water boil at. It is all a matter of altitude. If it is possible for our reader to climb up to some very high level and boil a quantity of water he would soon be assured of the fact.—Editor.

* * *

HOW MUCH HORSE POWER NEEDED.

Editor Sanitary Engineer.—Could you please inform me in an early issue of Sanitary Engineer, what size of tubular boiler in horse-power would I need to take care of 5,000 square feet of radiation including mains. I could easily find out if a cast iron boiler was to be used. Thanking you in anticipation.

A Fitter.

* * *

Replying to our reader, A Fitter, we may state, that one horse-power when applying such a term to the heating business, is estimated to be equal from 75 to 100 feet of radiation including mains, thus for 5,000 feet of radiation, it would be necessary to instal a boiler of from 50 to 67 2-3 horse-power, though

we would recommend a boiler of about 75 horse-power. One of the greatest mistakes made to-day, is the installing of too small capacity boilers and percentage of radiation.—Editor.

* * *

HOW MUCH BRONZE REQUIRED.

Editor Sanitary Engineer.—I am not extra busy just now and a customer of mine has asked me to give him two prices on bronzing the radiators in a large office building, viz.: in regular bronze and aluminum bronze. Could you let me know in your next issue of Sanitary Engineer whether a good job can be done with the heat on (hot water) and how to figure the material.

A. T. H.. B.C.

In answering A. T. H., we may say it is always advisable to have the heat on when bronzing radiators as the liquid flows better and gives a smooth finish.

It is estimated that one and one-eight quarts of ready-mixed bronzing liquid will cover about 275 feet of radiation. If the powder is bought dry, 1 lb. of powder to 1 quart of bronzing liquid will do the same.

For aluminum, one lb. of dry powder makes three quarts of liquid, and will cover about 550 square feet.—Editor.

* * *

PREVENT RADIATORS FROM ROBBING EACH OTHER.

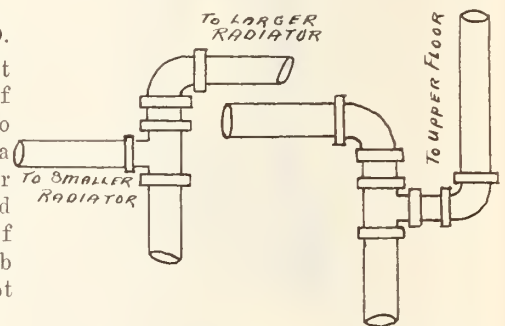
Editor Sanitary Engineer:

I have had some trouble with a hot water heating job I completed recently, some of the radiators work fine, while others, even on the same risers, do not heat as well. Could you inform me in your next issue of Sanitary Engineer several proper ways to take off branches to radiators?

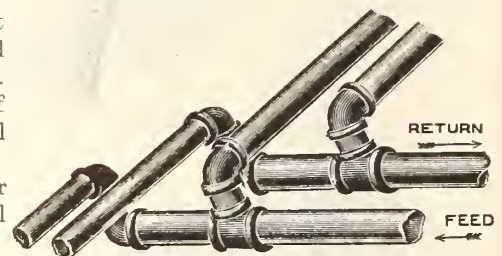
A Subscriber, B.C.

We are showing in Figures A, B, C, D, several methods of taking branches off

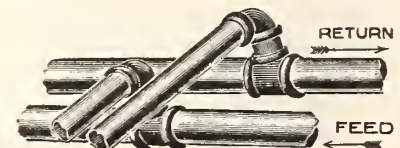
mains, etc., but as we are speaking of such troubles we will mention a case. The writer was called to a residence where a hot water system was giving poor satisfaction. There was plenty of



radiation, the furnace was large enough, and the water used to boil over in the expansion. Yet the radiators in the coldest rooms did not heat. It was found

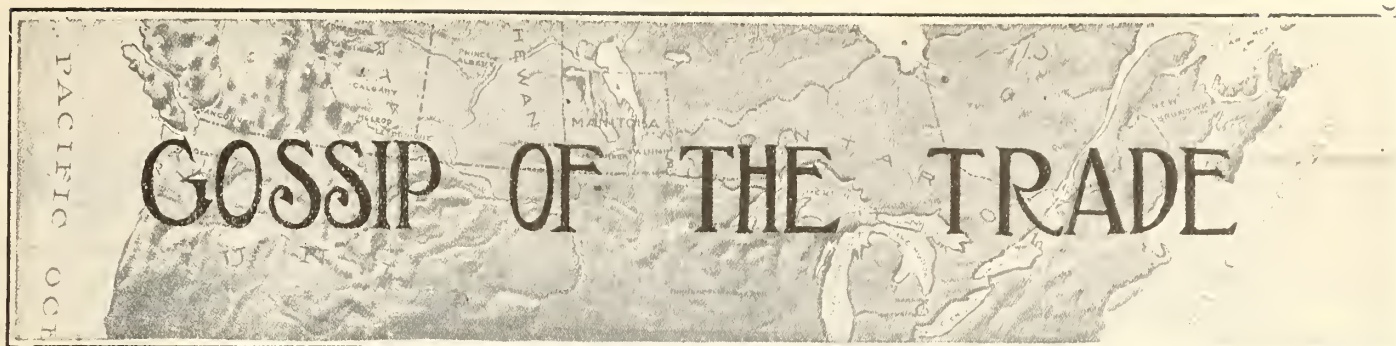


that the mains were too small, so to remedy the matter the expansion tank was connected to the bottom of the



boiler direct and a popular heat generator installed. Since that time the system has never failed to give the very best results.

Editor.



SANITARY INSPECTORS' ASSOCIATION GATHER IN REGINA.

Excellent Papers Read—Next Meeting Will be Held in Moose Jaw.

The second meeting of the Saskatchewan branch of the Sanitary Inspectors' Association of Western Canada was held by permission of the city commissioners in the council chamber of the City Hall on Saturday evening, when representatives of all the most important cities were present, together with R. O. Wynne-Roberts and the Regina staff.

In the temporary absence of T. Watson, who had been out of town on provincial business matters, the proceedings were opened by J. Martin, who extended a cordial welcome to the visiting delegates. Three papers all showing an intimate knowledge of the subjects in hand were read.

J. E. Thomas, of Moose Jaw, chose for his theme "Ventilation of Dwellings," and dwelt upon the importance of an adequate supply of unpolluted air as an agent in producing a robust state of health and avoiding the converse. Suggestions as to how ample provision might be made were given.

"Disinfection" was the title of an excellent paper read by J. Martin, of Regina. During the course of his remarks on this subject, Mr. Martin related some of the errors made by those who were not in possession of the latest information with regard to infectious disease, the most modern methods in dealing with the patient, the nurse, clothing, bedding and apartments.

After refreshments offered to their brother officers by the Regina men, the proceedings were continued, and H. E. Buck, of Saskatoon, contributed a paper, entitled "Things to be Remedied." That there is much to be done by the health officer was shown in a new and original light, and in a convincing manner which reflected great credit upon the writer of the paper.

The utmost interest was shown during the entire proceedings. Experiences bearing upon the subjects treated were freely related and the desire for an extended knowledge expressed. It is intended to hold the next conference at Moose Jaw during the month of April.

SANITARY INSPECTORS' ASSOCIATION PROGRAMME.

The Sanitary Inspectors' Association of Western Canada has prepared its course of instruction in sanitary science for the next five months, and the following are the subjects for addresses that will be given on alternate Saturdays, at 12 o'clock noon, in the offices of the health department in the City Hall: Jan. 24, "My Early Impressions of Sanitation in Winnipeg," by E. Marston; Feb. 7, "Pasteurization of Milk," A. F. Cummings; Feb. 21, "Infection," John Martin; March 7, "Inspection of Cheese and Butter," W. H. Rason; March 21, "Smoke Nuisance, Its Abatement and Prevention," W. F. Thornley; April 4, "The Practical Side of Tuberculin Testing," E. S. Bowman; April 18, "Sanitary Law," E. W. J. Hague; May 2, address by Dr. A. J. Douglas; May 16, "Food Inspection Among the Foreign Citizens," G. R. Mines; May 30, "Principles and Designs of Plumbing," P. Pickering.



Becomes Manufacturers' Agent.

R. J. McLaren, who for the past seven years represented Taylor-Forbes Co., Ltd., and prior to that was for 15 years representative of Dominion Radiator Co., Ltd., has now taken up a position as manufacturers' agent, with headquarters in Ottawa. He will handle several lines, all of which will be used in connection with the sanitary and heating business.

We feel that all who know Bob McLaren will join with us in wishing him every success in his new venture.



Neepawa, Ont.—A. G. Heys has opened up a sanitary and heating business and is employing none but first-class men, so as to give his customers the very best service.

Fort William is about to appoint a permanent medical officer of health. Ald. Manion is evidently on the right track when he states that the citizens of that fair city are the chief asset. We know they are not exactly dead, when such reports come in, we also know they have a live practical plumbing inspector.

NOT BUSY IN B.C.

There has not been the call for the services of plumbers this winter on the Pacific coast that has been usual for the past five or six years. The winter of a year ago seemed to complete a cycle of severe seasons, when water services were frozen, with the resultant rush for a plumber. At that time, too, there was plenty of other business going on and these rush jobs were not welcomed. This winter, however, conditions are much altered. The weather has been very mild, in fact early rose trees have leaves already out, with a new growth of two inches. Not only that, but building fell off with the general financial stringency of 1913. So altogether the winter has been rather quiet.

P. Barron, who was secretary of the plumbers' local, is on a trip to his home in England. He will return about the latter end of February, and will be a candidate for congratulations, since he will have assumed the role of a benedict.



PRACTICAL MEN ON BOARDS OF HEALTH.

Frank S. Walker, a member of the New Brunswick Society of Domestic Sanitary and Heating Engineers, is an active member of the Provincial Board of Health.

Geo. Blake, president of the Society is a member of the St. John Board of Health.

D. J. Shea, provincial vice-president, is a member of the Fredericton Board of Health.

Editorial Comment.

The above is very encouraging news and of such a nature that cannot be simply reported upon without comment.

It should be one of the chief aims of every society to procure a seat on the Board of Health in every village, town or city, as well as upon the various provincial boards of health.

We have been plumbers too long. We have let the grass grow under our feet, and now there seems to be an awakening influence spreading throughout the Dominion. It is the duty of every sanitary and heating engineer to see to it that

a member is on these boards. It will show the public that we are out to give them a square deal.

We have, from the public's viewpoint, been too one-sided, hence it is high time to take advantage of the opportunity now given us by the fact that some societies have succeeded. Why not all?



ONTARIO CONVENTION PROGRAMME.

The Ontario Society of Domestic Sanitary Heating and Ventilating Engineers held a meeting recently and decided the date of the coming annual convention.

This event will take place on Thursday, Friday and Saturday, March 19, 20 and 21st, at their headquarters, Canadian Foresters' Hall, 22 College Street, Toronto. A large number of the members are expected to be present, from all parts of the province.

We are instructed by the above society to extend a cordial invitation to all members of the craft throughout the Province of Ontario, whether members of the society or not. All are welcome.

A very interesting programme is being prepared, and so splendid addresses will be delivered. These will all be in the interest of the craft as a whole. Some of the subjects to be dealt with are as follows:

Provincial Sanitary Engineering Code. Technical Education as applied to the Craft.

Workman's Compensation Act, and its effect on the trade.

Proposed trip to New York to look into the Technical School question.

It may be further stated that all localities throughout the province in which there is no local society established are requested to write at once to S. F. Frankland, provincial secretary, 1093 Bathurst street, Toronto.



ANNUAL MEETING HELD.

THE annual meeting of the Toronto Society of Domestic Sanitary and Heating Engineers was held recently in their quarters, 22 College St., Toronto.

A large and enthusiastic number were present. The business of the past year was thoroughly discussed and all were pleased with the several reports submitted by the various committees.

President Waterman submitted his report in a very able manner, which was cordially received and unanimously adopted.

The various reports of the Executive Committee were ably presented by vice-president J. T. Aggett, chairman of the committee, which showed that a great amount of work had been done during the past year. These reports were received cordially and adopted.

SELECTION OF OFFICERS.

The following officers were appointed to act in the various capacities for the year 1914:

Officers Appointed.

President, J. T. Aggett.
Vice-President, T. B. Smyth.
Secretary, Jno. E. Fullerton, 89
Concord Ave., Toronto.
Treasurer, F. Maxwell.
Tyler, A. F. Passmore.
Auditors, T. Riley and W. Bodington.

Executive Committee.

Geo. Clapperton, W. Mansell, F. Gentle, A. F. Passmore, Geo. Kirtley, H. Farthing, H. Hillier, Jno. Wright, H. Waterman, N. Swanston, T. H. Ferguson, A. Read.

has been acquired. All features combine to make this the event of the season.



OTHER CITIES TO APPOINT PRACTICAL SANITARY ENGINEERS ON BOARDS OF HEALTH.

Several cities in New Brunswick propose appointing members of the craft on the boards of health, viz.—Woodstock, Moncton and St. Stephens. We cannot refrain from complimenting the New Brunswick association, which must have put forth a great deal of effort in attaining such successful results, and we feel sure all those cities mentioned are to be credited with having taken such a step. Such measures are bound

Don't Miss the Address on

Technical Education

to be delivered by

PROF. A. C. MCKAY

In C.O.F. Hall, 22 College St.

Monday Evening, February 16, 1914

at 8 o'clock

COMPLIMENTARY

The above lecture will be given under the auspices of the Toronto Society of Domestic, Sanitary and Heating Engineers. All members of the craft are welcome, and tickets may be procured by applying to J. E. Fullerton, secretary of the Association, 89 Concord Ave., Toronto.

The entertainment committee have completed very attractive arrangements for their annual "At Home" which will take place on Friday, January 30th, in the auditorium of the Canadian Order of Foresters' Hall, which is the headquarters of the Society. This is intended to be the event of the season, and a large number is expected to be present. There will also be present a large representative of the jobbers and supply men, and ladies. Cordial invitation was presented to the Editor of Sanitary Engineer, this paper being the official organ of the Dominion Associations of Canada, of which Toronto is a provincial branch.

Invitations were also sent out to other members of the local press. A splendid supper is in store for those who attend and the services of a first class orchestra

to bring good results, and we do not fear to state that where practical men are placed in such positions, the citizens will get better results than it is possible to get where such men are not on the boards of health. We have several cities in Canada which permit tile pipe for house drains, all because of there being no one on the boards of health who knows better. It is a disgrace to see such a state of affairs, particularly in a new country like Canada.

But with live association workers on all our boards of health, with medical health officers, who are ever on the alert to root out all kinds of insanitary methods, etc., which prevail in some of our cities, we may look forward with hope, that conditions will not be as they are very long.

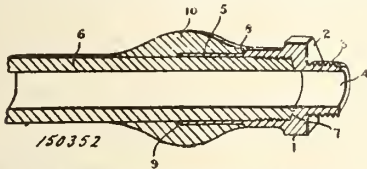
NEW CANADIAN PATENTS

No. 150,352.

John A. Lillie, Toronto, Ontario, Canada, 9th September, 1913; 6 years. Filed 26th February, 1913. Receipt No. 221,022.

Claim.—1. A soldering nipple comprising a sleeve adapted to embrace the end of the lead pipe and having a reduced nipple end formed integral therewith.

2. A soldering nipple comprising a sleeve adapted to embrace the end of the



No. 150,352. Soldering Nipple.

lead pipe, said sleeve being threaded internally and adapted to be screwed on to the end of the lead pipe and having a reduced nipple end formed integral therewith.

3. A soldering nipple comprising a sleeve adapted to fill the exterior of the pipe, and formed with a shoulder at one end adapted to abut the end of the pipe and a reduced nipple end, said sleeve also having the end opposite to the nipple reduced to form an exterior shoulder adapted to form the terminal of the encircling lead joint.

* * *

No. 150,320.

Frank W. Carmelich, Mobile, Alabama, U.S.A., 9th September, 1913; 6 years. Filed 12th May, 1913. Receipt No. 224,373.

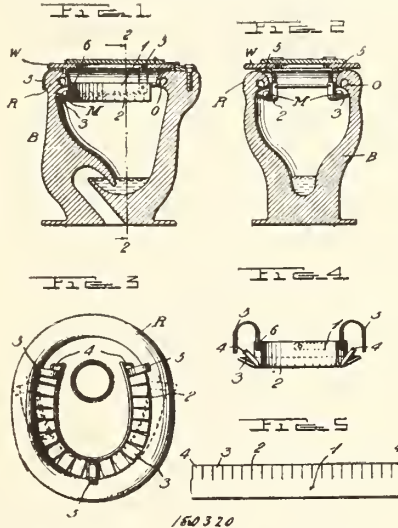
Claim.—1. The herein described disinfectant holder for water closet bowls and the like, comprising a channelled member horseshoe-shaped in plan view underlying the front and the two sides of the rim of the bowl and having the rear extremities of its channel closed, and supports rising from said member and adapted to pass over the rim for suspending the channelled member in position.

2. The herein described disinfectant holder for water closet bowls and the like, comprising a sheet metal strip bent into horseshoe shape and slitted transversely along one side so as to produce a series of tongues, the latter being upbent to form a channel surrounding the member, and the endmost tongues being upbent to a greater degree to close the ends of the channel, combined with means for suspending said member beneath the rim of the bowl as described.

3. The herein described disinfectant

holder for water closet bowls and the like, comprising a sheet metal strip bent into horseshoe shape and slitted transversely along one side so as to produce a series of tongues, the latter, being upbent to form a channel surrounding the member, combined with means for suspending said member beneath the rim of the bowl, as described.

4. The herein described disinfectant holder for water closet bowls and the like, the same comprising a channelled member of horseshoe shape in plan view, means for closing the extremities of the channel therein, and supports for said member consisting each of a pliable hook whose shank is pivoted to the inner wall of said channel so that it may be turned down into the same or stood upright, and



150,320. Disinfectant Holder.

whose bill is adapted when the hook is stood upright to be passed over the rim of the bowl.

* * *

No. 150,512.

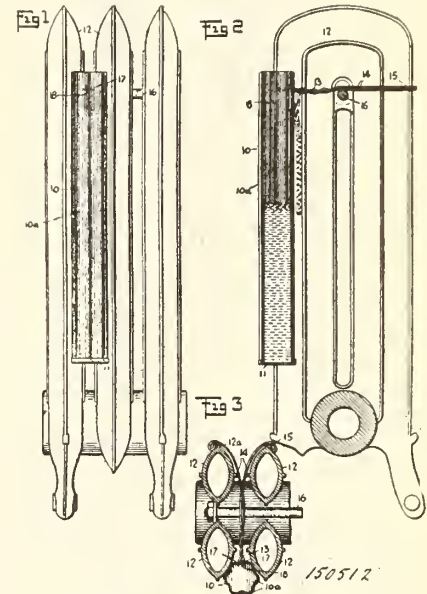
Gustave Adolf Mayer, New York City, New York, U.S.A., 16th September, 1913; 6 years. Filed 6th August, 1913. Receipt No. 227,660.

Claim.—1. A humidifier for radiators comprising a container adapted to fit between adjacent sections of the radiator and provided with an arm adapted to pass between adjacent pairs of radiator sections and having a bifurcated end, the members of which diverge and terminate in heads for engaging the two radiator sections in rear of those engaged by the container.

2. A humidifier for radiators comprising a container, and an arm projecting loosely through the container and provided within the container with a right angular member adapted to engage the

inner surface of the container when the arm is swung into horizontal position, said arm terminating in diverging members with heads at their ends.

3. A humidifier for radiators comprising a container provided with two holes adjacent its upper end, and a securing arm formed of a piece of wire bent upon itself at about its centre of length and



No. 150,512. Humidifier.

formed with a right angular loop, the members of the wire being passed through the holes of the container with the loop inside of the same and then twisted together outside of the container, the free ends of the wire diverging and formed with heads.

* * *

No. 150,670.

John Shanks, Barrhead, Renfrewshire, Scotland, 23rd September, 1913; 6 years. Filed 16th November, 1912. Receipt No. 216,918.

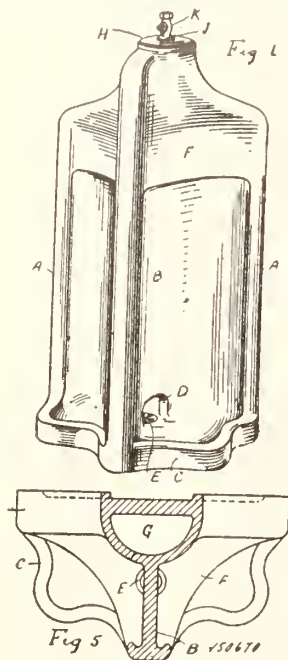
Claim.—1. A urinal comprising sides, a base and a superstructure formed integral, the superstructure being formed hollow to afford a closed flushing compartment.

2. A urinal superstructure whose upper part is formed hollow to afford a closed flushing compartment.

3. A urinal structure comprising sides and a base formed integral therewith and having an outlet, the upper part of the structure being formed hollow to constitute a tank, and an automatically discharging siphon fitted within said tank.

4. A urinal structure comprising a base piece formed with convergently sloping faces and with an outlet at the junction of said faces, side portions and

an intermediate portion affording stalls rising from said base, and an upper portion surmounting the stall portions formed hollow to constitute a tank.



No. 150,670. Urinal.

No. 150,696.

Mécanisme de réservoir de chasse-d'eau.
The B. O. T. Manufacturing Company.
Toronto, Ontario, Canada, assignee
of Bert O. Tilden, New York City,
New York, U.S.A., 30th September,
1913; 6 years. Filed 10th May,
1913. Receipt No. 224,283.

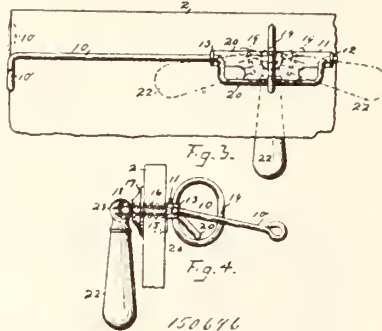
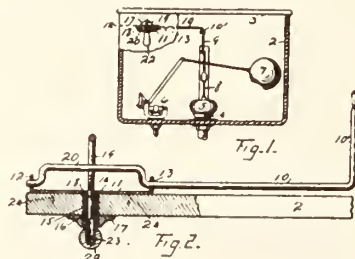
Claim.—1. The combination with a flush tank and a flush valve therein, of a rocking lever, one end of said lever connected with said valve, the opposite end of said lever having a crank, a rock shaft disposed at right angles to said lever, the one end of said shaft formed into a loop through which said crank passes, and means for rotating said shaft in opposite directions for causing said loop to rock said lever and open said valve.

2. The combination with a flush tank and a flush valve therein, of a rocking lever, one end of said lever connecting with said valve, the opposite end of said lever having a crank, a rock shaft journaled in the wall of the tank, the inner end of said shaft formed into a loop through which said crank passes, and a gravitative handle secured to the opposite end of said shaft adapted when swung to the right or to the left to cause said loop to partially rotate said lever for unseating said valve.

3. In a flush tank operating device, a rocking lever having an arm at one end adapted to connect with the flush valve, and having at its opposite end a U-shaped crank, a bracket for supporting said lever, said bracket having spaced perforated lugs between which the crank of said lever is disposed, a shaft piercing

the said bracket, the inner end of said shaft having an integral ring in which said crank is disposed, the said ring adapted to rock said lever when the shaft is partially rotated in opposite directions, and a depending handle secured to the opposite end of said shaft capable of being manually operated for rocking said shaft and said lever.

4. In a flush tank operating mechanism, the combination with a tank and a flush valve therein, of a rocking lever connecting at one end to the said valve, the opposite end bent to provide an elongated crank portion, a bracket having spaced bearing lugs adapted to support said lever, the said lugs aligning and positioned at the opposite ends of said crank portion for preventing the longitudinal movement of said lever, a



No. 150,696. Flush Tank Mechanism.

rock shaft piercing the wall of the tank, the inner end of the said shaft comprising a circular loop which encircles said crank portion of said lever, and adapted when said shaft is partially rotated to rock said lever in the direction for opening said valve, and means for manually operating said shaft.

No. 150,432.

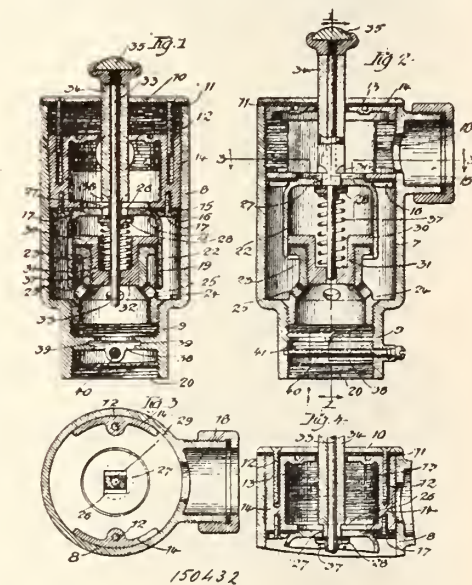
Charles F. Newton, assignee of Samuel C. Laidley, both of Chicago, Illinois.
U. S. A., 16th September, 1913; 6 years. Filed 17th October, 1912.
Receipt No. 215,627.

Claim.—1. In a flushing valve, the combination of a casing having therein a water inlet and a water outlet, a slidable hollow valve controlling communication between the water inlet and outlet, a head lying in the interior of said valve, means for moving said valve to unseated position, a vent valve in said slidable valve, means for actuating said vent valve to vent pressure from the interior of said slidable valve during the unseat-

ing operation thereof, means for admitting pressure to the interior of the slidable valve to break the suction between said head and slidable valve and permit the restoration of said slidable valve to normal position, and a spring interposed between said vent valve and head for returning said vent valve to closed position and assisting in the return movement of the slidable valve, substantially as described.

2. In a flushing valve, the combination of a casing having therein a water inlet and a water outlet, a slidable hollow valve controlling communication between the water inlet and outlet, a head lying in the interior of said valve, means for moving said valve to unseated position, a vent valve in said slidable valve, means for actuating said vent valve to vent pressure from the interior of said slidable valve during the unseating operation thereof, means for admitting pressure to the interior of the slidable valve to break the suction between said head and slidable valve and permit the restoration of said slidable valve to normal position, and a tension member for automatically seating said vent valve and for assisting the return of said slidable valve to normal position, substantially as described.

3. In a flushing valve, the combination of a casing having therein a water inlet and a water outlet, a slidable hollow



No. 150,432. Flushing Valve.

valve for controlling communication between said inlet and outlet, a fixed head within said valve, means for adjusting the degree of movement of said valve, means for exhausting pressure from the interior of the valve member during the unseating thereof, means for stopping said exhausting operation, and means for admitting pressure to the interior of the valve between the head and valve to permit restoration of the valve to normal position, substantially as described.

BUILDING PERMITS for DECEMBER and 12 MONTHS

REPRINTED FROM FINANCIAL POST, JAN. 24TH ISSUE.

	Dec., 1913.	Dec., 1912.	Inc.	%	12 Mos., 1913.	12 Mos., 1912.	Inc.	%
MARITIMES—								
Halifax	\$ 34,200	\$ 38,335	\$ *4,135	14.6	\$ 835,850	\$ 589,775	\$ 246,075	41.7
Sydney	2,565	4,840	*2,275	47.4	321,198	656,111	*334,913	51.0
St. John	12,950	18,500	*5,550	30.0	2,380,660	566,200	1,814,460	320.4
QUEBEC—								
Montreal	1,308,230	685,675	622,555	90.7	27,032,097	19,408,690	7,623,407	39.2
Maisonneuve	148,500	92,500	56,000	60.5	2,454,923	2,685,828	*230,905	8.6
Outremont	91,000	14,000	77,000	550.0	1,819,000	1,582,000	237,000	14.9
Westmount	220,600	82,100	138,500	168.7	2,009,544	1,824,369	175,175	9.6
Quebec	61,291	9,400	51,891	552.6	1,929,781	933,002	996,779	106.8
ONTARIO—								
Berlin	98,390	5,195	93,195	1892.2	947,571	834,213	*186,742	22.3
Brantford	53,680	107,005	*53,225	49.8	1,015,886	1,167,105	*151,219	12.9
Chatham	8,935	2,500	6,435	257.5	338,310	201,591	136,719	67.8
Guelph	17,615	1,715	15,900	935.3	357,335	388,499	*31,164	8.0
Fort William	283,400	575,960	*289,560	50.0	4,265,715	4,039,600	126,715	3.1
Hamilton	235,050	231,100	3,950	1.7	5,110,000	5,491,800	*381,800	7.0
Kingston	85,207	10,465	74,742	711.8	666,474	645,774	20,700	3.2
London	47,035	27,263	19,775	72.4	1,789,920	1,136,108	653,812	57.5
North Bay	5,410	1,000	4,410	441.0	492,940	462,675	30,265	6.5
Ottawa	94,550	199,800	*105,250	52.6	3,991,380	3,621,850	369,530	10.2
Peterborough	47,605	10,010	37,595	376.0	488,540	465,905	22,635	4.8
Port Arthur	25,075	1,234,700	*1,209,625	98.0	1,935,185	2,494,179	*558,994	22.4
Preston	7,640	27,800	*20,160	72.5	400,055	337,160	62,895	18.6
St. Catharines	81,405	10,500	70,905	675.2	759,478	811,335	51,857	6.3
St. Thomas	6,900	11,050	*4,150	34.0	154,471	89,946	64,525	71.7
Stratford	4,290	6,300	*2,010	32.0	334,085	439,496	*105,411	24.0
Toronto	1,448,768	1,936,685	*487,917	25.1	27,038,624	27,401,761	*363,137	1.3
Welland	57,500	10,333	47,167	458.0	611,157	469,744	141,413	30.1
Windsor	98,700	80,000	18,700	23.3	1,148,975	988,063	160,912	16.4
Total East (27 cities) ..	\$4,586,491	\$5,431,731	*845,240	15.5	\$90,329,154	\$79,732,579	\$10,586,575	13.2
MANITOBA—								
Winnipeg	504,950	160,450	344,500	214.7	18,621,650	20,563,750	*1,942,100	9.5
St. Boniface	34,000	8,400	25,600	304.7	1,038,840	1,251,512	*212,672	16.9
SASKATCHEWAN—								
Moose Jaw	114,200	326,225	*212,025	65.0	4,238,470	5,275,797	*1,037,327	19.6
N. Battleford	5,340	15,000	*9,660	64.4	859,195	850,975	8,220	0.9
Prince Albert	5,900	7,550	*1,650	22.0	1,380,290	2,042,450	*662,160	32.4
Regina	28,925	2,209,675	*2,180,750	98.7	4,018,350	8,047,309	*4,028,959	50.0
Saskatoon	3,900	82,125	*78,225	95.2	4,453,845	7,640,530	*3,186,685	41.7
Swift Current	16,940	4,700	12,240	260.4	1,019,158	792,014	227,144	28.7
Weyburn	6,500	2,200	4,300	195.4	177,400	766,660	*589,260	76.5
Yorkton	38,950	25,760	13,190	51.1	437,777	735,966	*298,189	40.5
ALBERTA—								
Calgary	336,000	1,033,560	*697,560	67.5	8,619,153	20,394,220	*11,775,067	52.8
Edmonton	147,400	680,532	*533,132	78.3	9,242,450	14,446,819	*5,204,369	36.0
Lethbridge	7,480	69,805	*62,325	89.3	504,954	1,358,250	*843,296	62.0
Red Deer	1,500	4,880	*3,380	69.0	149,250	389,015	*239,765	61.6
Medicine Hat	8,425	70,480	*62,065	88.1	3,851,572	2,836,219	1,015,353	40.0
BRITISH COLUMBIA—								
Nanaimo	25,400	13,250	12,150	92.0	295,360	321,422	*26,062	8.1
New Westminster	34,205	55,150	*20,945	38.0	958,975	1,634,518	*675,543	41.3
Nelson	1,000	3,400	*2,400	70.6	131,100	273,865	*142,765	52.1
Oak Bay	33,875	79,705	*45,830	57.5	836,708	1,133,351	*296,643	25.9
Vancouver	194,400	1,570,375	*1,375,975	87.6	10,248,803	19,420,435	*9,181,629	47.2
S. Vancouver	16,630	77,300	*60,670	78.4	895,000	2,600,000	*1,705,000	65.5
Victoria	104,145	742,855	*638,710	85.9	4,037,992	8,208,155	*4,170,163	50.8
Vernon	9,050	28,017	*18,967	67.7	173,173	446,142	*275,969	61.1
Total (West)	\$1,679,115	\$7,271,394	\$5,592,279	76.9	\$77,189,465	\$121,429,371	*\$44,239,912	36.4
Summary.								
Maritimes (3)	49,715	61,675	*11,960	19.3	3,537,708	1,812,086	2,725,622	150.4
Quebec (5)	1,829,621	883,675	945,946	107.0	35,245,345	26,433,889	8,801,456	33.3
Ontario (19)	2,707,155	4,486,481	*1,779,326	39.6	51,546,101	51,486,204	59,897	.1
Manitoba (2)	538,950	168,850	370,100	219.5	19,660,490	21,815,262	*2,154,772	9.8
Saskatchewan (8)	220,655	2,673,235	*2,452,580	92.4	16,584,485	26,151,701	*9,567,232	36.5
Alberta (5)	500,805	1,859,257	*1,358,452	73.0	22,367,379	39,424,523	*16,057,144	40.7
British Columbia (8) ..	418,705	2,570,052	*2,151,347	83.7	17,577,116	34,037,885	*16,460,769	48.3
Grand Total (50 cities) .	\$6,265,606	\$12,703,225	*\$6,437,619	50.5	\$167,518,614	\$201,161,550	\$33,642,942	16.2

*Decrease.

Canada Metal Co.'s Sales Staff in Annual Convention

Trade Conditions Discussed—Papers Read by Various Salesmen—Theatre Party on First Day of Convention.

THE annual convention of the managers and sales staff of the Canada Metal Co. was held at the head office, Toronto, during the week, beginning January 5.

Managers were present from the Montreal and Winnipeg offices, and the salesmen were gathered from all parts of the Dominion.

The convention opened on Monday, January 5, with W. G. Harris, Jr., vice-president of the company, in the chair. His opening address was a welcome to all. He stated what a pleasure it was once more to meet them in Toronto. In a concise manner he dealt with the objects of the convention.

Amongst others was the exchange of ideas on trade conditions throughout the Dominion, which would prove rich in

No. 1. How to judge credits.

No. 2. Business morality.

No. 3. What I purpose doing in 1914 to increase my sales.

No. 4. How I made such a success with my sales of Imperial Soldering Paste to the electricians.

No. 5. How I beat all records for the sale of Harris Heavy Pressure in 1913.

This convention brought men together from all parts of the Dominion and was certainly devoid of one slow moment from the opening to the close, the only break in the proceedings being to partake of lunch which was prepared on the premises and was done justice to by the good fellows around the festive board.

The first day concluded with the entire sales staff attending the Princess Theatre to see F. R. Benson's company



W. G. HARRIS, Sr.



W. G. HARRIS, Jr.

information, also the great benefit derived by the discussions on metals and plumbing lines, the general knowledge gained would prove of infinite benefit to all concerned, for no man can know too thoroughly the lines he has to offer.

The president, W. G. Harris, Sr., also had a word of welcome and spoke of the strenuous year just past. He stated that it was a year of which every one in connection with the Canada Metal Co. had just reason to be proud, for it was the best and most progressive year in the history of the company. It was a source of gratification to stand up and say "1913 was the best year to date and our salesmen are to be congratulated, for upon reviewing the records of the past year we find that every one without exception has increased his sales."

Many interesting papers were read by the various salesmen upon such diversified subjects as:—

in Henry V., and to say it was thoroughly enjoyed is to put it mildly. Many were more familiar with metals than Shakespeare, though they readily recognized the quotation:—

"If it be a sin to covet honor I am the most offending soul alive."

for as one exclaimed, "That is in our Babbitt Book."

On Tuesday morning the convention opened promptly at 9.30 and during the day many important phases of the firm's business were discussed.

When the convention closed it was aptly described as a convention beneficial to both salesmen and their customers, and the salesmen dispersed with the conviction that the factory, and the men behind the factory would, by giving service and quality, enable them at their next convention to again say our sales are once more ahead, and we are proud to represent an organization such as the Canada Metal Company.

GOSSIPS OF THE TRADE.

Moose Jaw.—Provincial Sanitary Engineer R. H. Murray, visited Moose Jaw last week for the purpose of inspecting the system of sewage disposal.

Winnipeg.—A new establishment has recently been opened in the heating business and will be known as the Metal and Heating Co., Winnipeg, Man.

Nova Scotia.—The Canadian Manufacturers' Association are issuing a splendid pictorial book, entitled *The Industrial Ascendancy of Nova Scotia*. To those of our readers who are strangers to the doings of this portion of the Dominion it will prove quite a revelation. Up till recently the larger part of the population have no doubt always had the opinion that the Nova Scotian, was more of a fisherman and a curer of fish, etc. But this book certainly proves the opposite. Though while we certainly look to that fair country for a large quantity of our fish supply, we must as a whole feel that Nova Scotia is far ahead of all our expectations. She is to be credited with having being thoroughly inoculated, and successfully so, with the spirit of big business and enterprise. Anyone wishing to procure one of these books no doubt may procure one by applying to the publicity committee of the Canadian Manufacturers' Association, Box 680, Halifax, N.S.



AND THERE YOU ARE.

It is the customers that get burnt at a Fire Sale.

* * *

An agriculturist is a farmer who owns an automobile.

* * *

Knowledge is the gradual discovery that you possess precious little.

* * *

There is no need for advertising a reward for the day that is lost.

* * *

The man who invented the cabaret put the din in dinner and took the rest out of restaurant.

* * *

On the highway of success you can go as far as you darned please without fear of getting pinched.

* * *

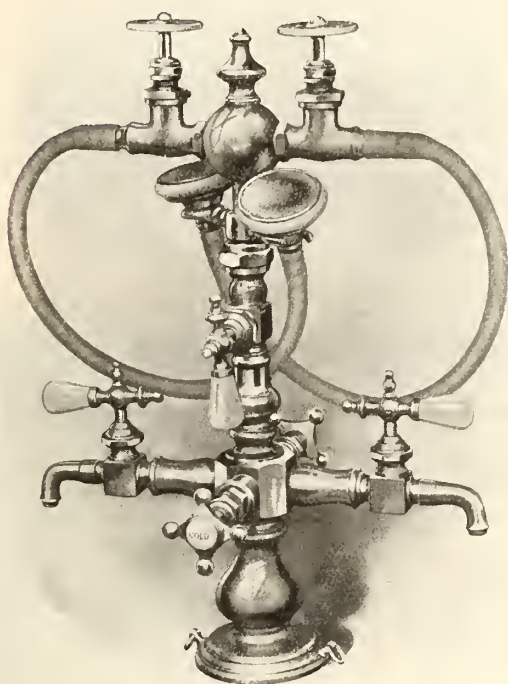
An optimist is one who makes two "ha ha's" grow where before there was only a huh.

* * *

Clothes might not make the man but they very often make the opportunity that makes the man.

* * *

We don't all get business from our friends, but we can make friends of those from whom we get business.—Institute Wire of the Alexander Hamilton Institute.



Morrison Quality—

for that particular client who knows the best and wants it—for a reputation as a sanitary engineer, who gives real satisfaction, whose work is dependable—for a bigger, better business, and that name-plate on the job when it's finished.

Morrison Quality Fittings—everything you require from the ordinary pipe fitting to the high-class fixture.

Write for particulars of any line.

The James Morrison Brass Mfg. Co., Ltd.
93-97 Adelaide St. West, TORONTO



G.M.C. Water Systems

Watch this space for something new and original in each issue.

The cut shows our Standard Hand System.

SPECIFICATIONS.

An Electric Weld Steel Tank—Tested 200 lbs.

A double-acting Brass-Lined Pump—3 in. dia. x 5 in. stroke—capacity at 40 strokes per min., 600 gal. per hour.

High-grade Pressure and Water Gauges, Foot Valve, Check Valve, Stop and Waste Cock, Hose Bib, with pipe and fittings as shown.

An automatic Air Valve that will not unprime the pump.

All mounted on a substantial cast-iron base ready to set up and connect to Well and to House Service Line, reducing cost of installation to a minimum.

Send for Bulletin No. 4—The Hydro-Pneumatic Water System—How It Operates.

The General Machinery Co., Ltd.,

22 Mulock Avenue, Toronto

LEAD PIPE LEAD WASTE



BLOCK TIN PIPE

The Canada Metal Co., Ltd.,

Head Office
and Factory,

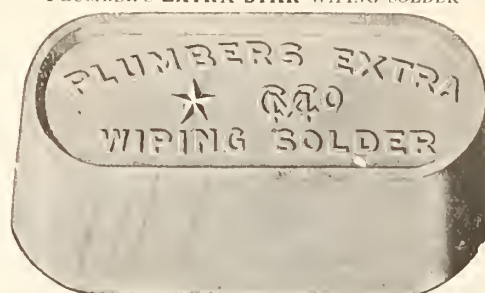
TORONTO

THE SOLDER WITH THE TIN IN

Branch
Factories MONTREAL, WINNIPEGWE MANUFACTURE
FOR THE PLUMBER

Lead Pipe Lead Waste
Hydraulic Drawn Traps
Non-Siphon Centrifugal Cast
Trap (Ask for Cut or Price).
Strictly Bar Solder
Star Extra Wiping (Best on
Earth)
Easy Wiping Solder
Acme Wiping
Brass Ferrules (Select) Tinned
Iron and Lead Combination
Ferrule Bends or Span End Test
Sheet Lead Lead Fibre

PLUMBER'S EXTRA STAR WIPING SOLDER



Economy Automatic Condensation Pump and Receiver

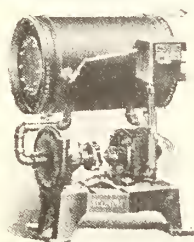


Fig. 2129.

An expansion tank, an automatic switch and a centrifugal pump automatically operated by an electric motor.

STIMULATES CIRCULATION by drawing condensation through system, venting the air and returning the water to the boiler at high temperature.

ELIMINATES SNAPPING and **CRACKING** in the radiators and pipes.

A STIMULANT AND GOVERNOR to the entire system.

A great SAVER OF FUEL. Requires no attention other than an occasional oiling.

Operates equally well on high or low pressure systems.

Tell us your troubles and we will advise you how to overcome them.

Thomas & Smith, Inc. 116-118 North Carpenter Street, CHICAGO, ILL.

Canadian Distributors: FRANCIS HANKIN & COMPANY, 117 Mail and Empire Building, Toronto, Ont.; 201 Coristine Building, Montreal, Que.; J. A. McTAGGART & COMPANY, Travellers Bldg., Winnipeg, Man.

Not an Enterprise for
the "Quitter"

¶ "If there is one enterprise on earth," says John Wanamaker, "that a 'quitter' should leave severely alone, it is advertising. To make a success of advertising one must be prepared to stick like a barnacle on a boat's bottom."

¶ "He must know before he begins it that he must spend money—lots of it."

¶ "Somebody must tell him that he cannot hope to reap results commensurate with his expenditure early in the game."

¶ "Advertising does not jerk; it pulls. It begins very gently at first, but the pull is steady. It increases day by day and year by year, until it exerts an irresistible power."

ALPHABETICAL LIST OF ADVERTISERS

Occasionally advertisements are inserted in the paper after the index has been printed. The insertion of the Advertiser's name in this index is not part of the advertising order.

The index is inserted solely for the convenience of the readers of the paper.

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MASTER PLUMBERS : ATTENTION !

DESOLVO THAWS FROZEN PIPES

There is a new way to thaw frozen pipes. Live, up-to-date plumbers who know that time saved means money earned and greater profits are using

DESOLVO PIPE CLEANER

on all their frozen pipe jobs. DESOLVO is a combination of mineral elements, so intermingled that upon the introduction of water a chemical reaction takes place, generating an intense heat. This solution of DESOLVO, poured into the pipe, goes straight to the base of the trouble, and without risk of injury to the pipes or connections, thaws the ice and makes the passage free and clear. A 20-minute job.

Note these actual test figures.

Plumber—Ordinary method for cleaning frozen pipes, 2 to 3 hours, charge.....\$4.00
Plumber—Using DESOLVO for cleaning frozen pipes, 20 minutes, charge.....\$1.00

Time saved—1½ to 2½ hours

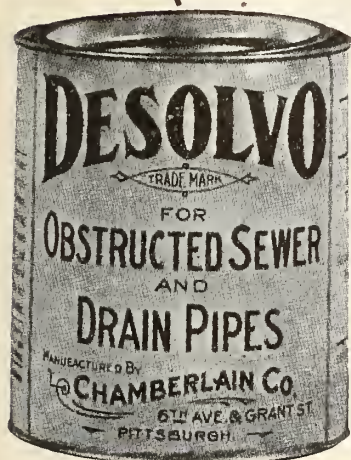
DESOLVO also removes rust and scale, and all other obstructions in drain and sewer pipes, and it serves as a disinfectant.
Pays for itself many times over on one job alone.

Order from your jobber, or write us direct for booklet.

The Chamberlain Company

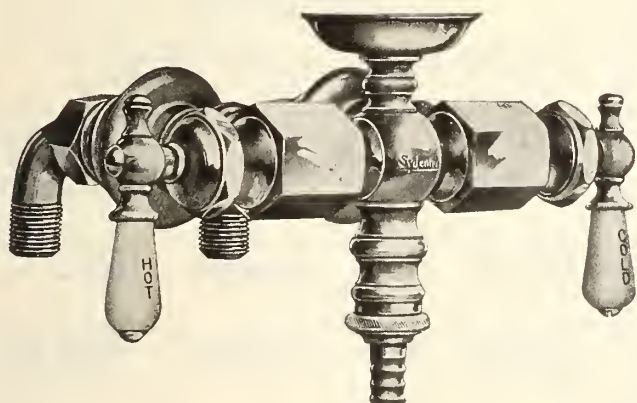
Manufacturing Chemists

Pittsburgh, Pa.



Ask Your Jobber for this SYDENHAM BATH COCK

It's New—It's Different
It's Better



Quick-opening compression style with full half-inch capacity throughout.

Heavy construction, massive in appearance.

Flexible cotton seat washers. Flanges have three-eighths of an inch adjustment without showing threads on stud.

Made with Porcelain or Metal Handles, with and without Jewel Tray.

THE WALLACEBURG BRASS & IRON MANUFACTURING CO., LIMITED

WALLACEBURG, ONTARIO.

Toronto,
L. N. Vanstone,
8-10 Wellington St. E.

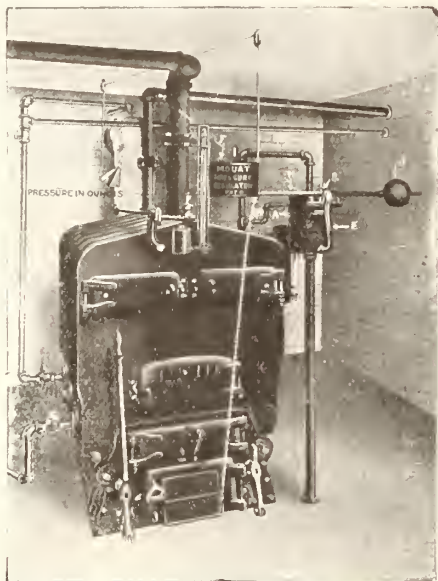
Winnipeg,
Moncrieff & Endress, Ltd.,
Scott Bldg.

Montreal,
J. R. Devereux,
142 St. Joseph Boulevard West.

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

The Mouat Graduating Vapor Heating System

Positive temperature control at each radiator.
Any fractional portion of a radiator may be heated to suit weather conditions.



The Mouat Automatic Vapor and Damper Regulator is the simplest, safest and most efficient device of its kind on the market.

Live heating contractors wanted to represent us in the Dominion.

Write to-day for our proposition.

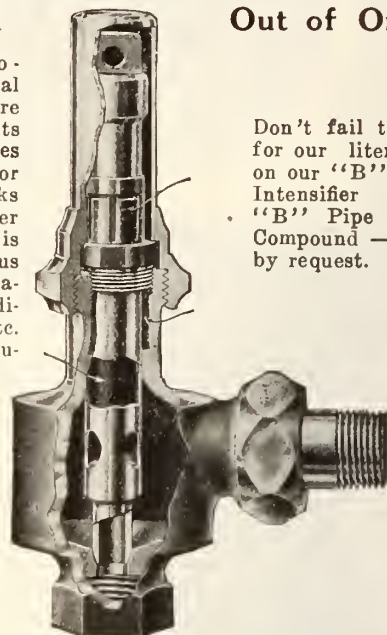
The Mouat-Squires Company, Cleveland, Ohio

NATIONAL VALVES

**Are Ordered and Reordered
—Never Get Out of Order**

National Thermo-static is an ideal valve. Its claims are based only on its deeds, and it does what is claimed for it and more. It works faithfully and never jumps its job. It is adapted to various work. For use on vacuum systems, radiators, heat coils, etc. No deformation troubles possible; the brass encased composition prevents it from being buckled or bent.

More merits about the valve by writing for more information.



Don't fail to ask for our literature on our "B" Heat Intensifier and "B" Pipe Joint Compound — free by request.

NATIONAL STEAM SPECIALTY CO.

24-26 S. Clinton Street,

CHICAGO

Surplus, Dunn & Co., 74 Murray Street,

NEW YORK

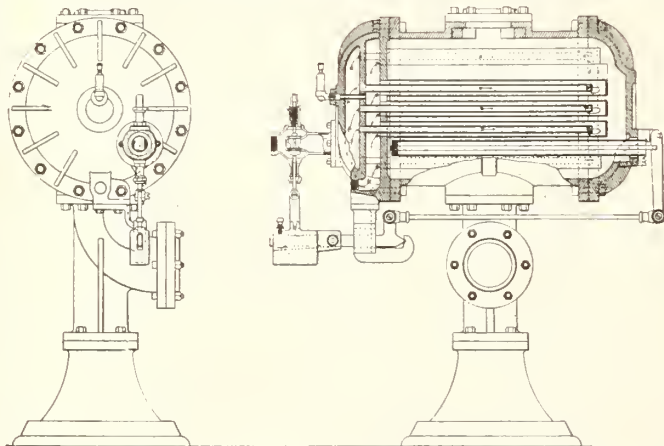
L. N. Vanstone, 8 Wellington St. East, Toronto.

Moncrieff &

Endress, Limited, Scott Building, Winnipeg.

The "Manny" Heater

**Affords Every Aggressive Steamfitter An
Excellent Opportunity to Make Large Profits**



The Manny Heater is connected to a hot water system as the ordinary hot water furnace, and steam is carried to it from a boiler house stationed outside the main building, at regular boiler pressure, but reduced at every heater by a steam pressure reducing valve to 20-15-10-5 lbs., or as low as one pound to the square inch, according to temperature required in the building. The steam is carried to the Manny Heater from the boiler room through underground pipes. There isn't a better or more economical way of heating large buildings. Many furnaces can be eliminated and much space saved. Supplied with or without Thermostats. Notice how provision is made for the expansion and contraction of tubes—Threaded Joints.

Let us give you full particulars, regarding this newest and best method of heating. Write for descriptive catalog F.

The E. S. Manny Co., Montreal

300,000 lbs.

carried in stock for immediate
shipment of

**Brass and Copper Pipe
Iron Pipe Size.**

Brass and Copper Tubing.

Brass and Copper Rod.

Brass and Copper Sheet.

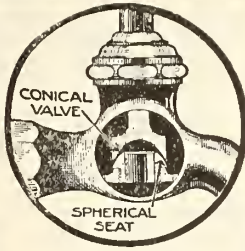
Tallman Brass & Metal Co.
HAMILTON, ONT.

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

It can't leak!

Leaky faucets that require constant re-washing are destined to become a thing of the past.

Thousands of plumbers everywhere are installing the new



JM WASHERLESS FAUCET

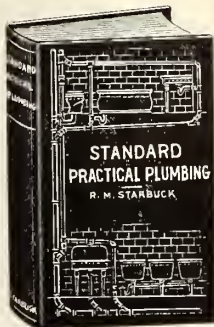
It is the only faucet on the market with a conical valve that closes on a spherical seat (see illustration). Seats perfectly under all conditions. Can't drip or leak. Can't get out of order. No washers to wear out. No splashing. No water hammer or whistling. Operates equally well on high or low pressure. Seat is self cleaning.

Eliminates water waste—a great boon to property owners and municipal authorities.

Not an experiment. Thousands in use for years. Adopted by municipal water boards. Pronounced by experts the most perfect faucet on the market. Seatings guaranteed for ten years against ordinary wear and tear.

Write our nearest Branch for Booklet.

**THE CANADIAN
H. W. JOHNS-MANVILLE CO., LIMITED**
TORONTO MONTREAL WINNIPEG VANCOUVER 2158



A WANTABLE BOOK

Standard Practical Plumbing

By R. M. Starbuck

347 SPECIALLY MADE ILLUSTRATIONS
PRICE \$3.00

"Standard Practical Plumbing" is indispensable to the Master Plumber, the Journeyman Plumber, and the Apprentice Plumber. As the book is specially strong in the exhaustive treatment of the skilled work of the plumber, it commends itself at once to every one working in any branch of the plumbing trade. Send for it to-day.

TECHNICAL BOOK DEPARTMENT

MACLEAN PUBLISHING COMPANY
143-149 UNIVERSITY AVENUE - TORONTO



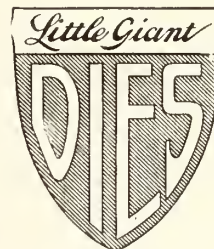
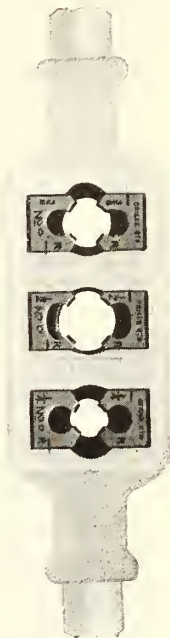
The Connection

between the smiling face, the sturdy hands and the three sizes of smooth threads is the



A Combination of 3 dies in 1 Stock—a smile-producer.

But this efficient, simple, rugged tool would be of little value apart from the three



They do the Work

Sold by Leading Supply Houses

Manufactured by

Canadian Tap and Die Company
Galt, Ontario

Little Giant Dies are the most dependable Pipe Dies under all conditions; simplest construction; longest lived. As the cutting strain increases, the grip of the Stock with Die tightens.

Condensed or "Want" Ads.**FOR SALE**

WILL SELL THE EXCLUSIVE RIGHTS OF handling the B-H Vapor Vacuum Specialties in Canada to reliable party. Address B-H Vapor Vacuum Heating Co., Emporia, Kansas.

READERS

The Editor wishes every one interested in

**Domestic Sanitary
Heating and
Ventilating
Engineering**

to make use of this paper. Any article or problem of interest, any topic of note will be used if any such has a tendency to uplift the Trade.

Every local or provincial association can use this paper free of charge to make other members acquainted with the business done and benefits derived from being an organized body.

When writing advertisers kindly mention having seen the advertisement in this paper

STUDY**These Uncrowded Professions**

Sanitary Science and Engineering, Sanitary Inspectorship, The Science of Plumbing, Hygiene, under the directorship of Prof. Arthur Bateman, M. Inst. S.E., A. R. San, I., M. I. P., R. P. C., Eng

SUCCESS GUARANTEED.

Write for free booklet.

Desk 3

Anglo-American Sanitary Correspondence College, 10-12 W. Ontario St., Chicago, Ill.

One of the most successful retailers of late years says: "When a firm advertises in trade papers it is getting into good company. As I pick up one of a dozen of these periodicals here in my office, and glance through it, I find that the best people, the successful firms, are represented in such a way as to reflect their importance in the trade."

SYPHONS

FOR

SEPTIC TANKS

WATSON AND PAUL

93 St. Genevieve Street, Montreal



**GENUINE
ARMSTRONG STOCKS
and DIES**

FOR THREADING PIPE OR BOLTS

KNOWN, USED,
COMMENDED EVERYWHERE

PIPE MACHINES,

both Hand or Power

HINGED PIPE VISES

PIPE CUTTERS

PIPE WRENCHES

RATCHET ATTACHMENTS

BARD ADJUSTABLE

BUSHINGS

Manufactured by

**THE ARMSTRONG M'F'G.
CO.**

317 Knowlton St.

BRIDGEPORT, CONN., U.S.A.
NEW YORK CHICAGO

WRITE FOR CATALOG

Only One

kind is necessary for your various jobs—fittings or pipe. You can save the cost and the carrying about of more than one tool.



Williams' "AGRIPPA" Chain Wrenches are recommended unconditionally.

Williams' "AGRIPPA" Chain Wrenches do not depend upon only one point of contact for a bite—long life of wear assured.

Williams' "AGRIPPA" Chain Wrenches never place any compounded strain upon the chain—continuous operation assured.

Williams' "AGRIPPA" Chain Wrenches bear every mechanical feature necessary to complete utility and service—operating efficiency guaranteed.

YOUR DEALER WILL SERVE YOU.

J.H. Williams & Co.

Superior Drop-forged Tools

77 Richards St., Brooklyn, N.Y. City
40 So. Clinton St., Chicago, Ill.

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

Classified Buyers Guide

Occasionally advertisements are inserted in the paper after the index has been printed. The insertion of the Advertiser's name in this index is not part of the advertising order. The index is inserted solely for the convenience of the reader of the paper.

Asbestos Goods.
Can. Johns-Manville Co., Toronto.

Air Line Systems.
C. A. Dunham & Co., Ltd., Toronto.

Aluminum Casting.
Tallman Brass & Metal Co., Hamilton.
Canada Metal Co., Toronto.

Brass Castings.
Tallman Brass & Metal Co., Hamilton.
James Morrison Brass Mfg. Co., Toronto.

Brass Goods, Valves, Etc.
James Morrison Brass Mfg. Co., Toronto.
Wallaceburg Brass Mfg. Co., Wallaceburg, Ont.
Empire Brass Mfg. Co., London.
Dunham, C. A., Toronto.

Brass Pipe and Tube.
Empire Brass Mfg. Co., Toronto.
Tallman Brass & Metal Co., Hamilton.
Canada Metal Co., Toronto.

Boilers, Steam or Hot Water.
Warden, King, Ltd., Montreal.
Steel & Radiation, Toronto.
Pease Foundry Co., Ltd., Toronto.

Burners.
Standard Heating & Radiator Co., Pittsburg, Pa.

Correspondence Schools.
Anglo-American Sanitary School.

Country Residence Equipments.
National Equipment Co., Toronto.

Chicago Pump Co., Chicago.
Leader Iron Works, Chicago.

Closets.
Empire Brass Mfg. Co., London.
James Morrison Brass Mfg. Co., Toronto.
Galt Brass Co., Galt.
Amherst Foundry Co., Amherst, N.S.
Johns-Manville Co., Toronto.

Drainage Fittings.
Fittings, Limited, Oshawa.
Warden, King, Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Empire Brass Mfg. Co., Ltd., London.

Ejectors, Steam.
James Morrison Brass Mfg. Co., Toronto.
Kerr Engine Co., Walkerville.
Tallman Brass & Metal Co., Hamilton.

Ejectors for Sewage.
Chicago Pump Co., Chicago.
Thomas & Smith, Chicago.
National Equipment Co., Toronto.

Fittings.
Fittings, Limited, Oshawa.
Steel & Radiation, Ltd., Toronto.
Warden, King, Ltd., Montreal.
James Morrison Brass Mfg. Co., Toronto.
Empire Brass Mfg. Co., London.
National Steam Specialty Co., Chicago.

Generators.
Honeywell Heating Specialty Co., Montreal.
James Morrison Brass Mfg. Co., Toronto.

Heaters.
Steel & Radiation, Ltd., Toronto.
Warden, King, Ltd., Montreal.
Standard Heating & Radiator Co., Pittsburg, Pa.
Pease Foundry Co., Ltd., Toronto.

Lead.
Canada Metal Co., Ltd., Toronto.
Tallman Brass Mfg. Co., Hamilton.
Empire Brass Mfg. Co., London.
James Morrison Brass Mfg. Co., Toronto.

Machinery Pipe Threading.
Hall & Sons, Ltd., Brantford.

Nipples.
Canadian Tube & Iron Co., Ltd., Montreal.
Warden, King, Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Canada Metal Co., Ltd., Toronto.
Galt Brass Co., Galt.
Canadian Brass Co., Galt.
Empire Brass Mfg. Co., Ltd., London.
Wallaceburg Brass Mfg. Co., Wallaceburg.
Canadian Wolverine Co., Ltd., Chatham.
James Morrison Brass Mfg. Co., Toronto.

Packing.
Canadian Johns-Manville Co., Ltd., Toronto.

Pipe, Black and Galvanized.
Canadian Tube & Iron Co., Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Warden, King, Ltd., Montreal.

Pipe, Soil, and Fittings.
Empire Brass Mfg. Co., London.
Galt Brass Mfg. Co., Galt.

Pumps.
Leader Iron Works, Chicago.
Chicago Pump Co., Chicago.
C. A. Dunham & Co., Ltd., Toronto.
National Equipment Co., Toronto.
Thomas & Smith, Inc., Chicago.

Radiators.
Warden, King, Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.

Reducing Pressure Valves.
C. A. Dunham & Co., Ltd., Toronto.

Steam Specialties.
Dunham, C. A., Co., Toronto.
National Steam Specialties, Pittsburg, Pa.
Mouat-Squires Co., Cleveland.
Honeywell Heating Specialty Co., Montreal.
Kerr Engine Co., Walkerville, Ont.
The E. S. Manny Co., Montreal.
Dart Union Co., Ltd., Toronto.

Tools.
Canadian Tap & Die Co., Ltd.
Borden-Canadian Co., Toronto.
Nye Die, Tool & Machine Co., Chicago.
Hall & Sons, Ltd., Brantford.
Armstrong Mfg. Co. Bridgeport, U.S.A.
Williams, J. H., & Co., Brooklyn, N.Y.

Unions.
Dart Union Co., Ltd., Toronto.

Vacuum Systems of Heating.
C. A. Dunham & Co., Ltd., Toronto.

Nothing Like It as a Compression Stop and Waste—It's a Winner

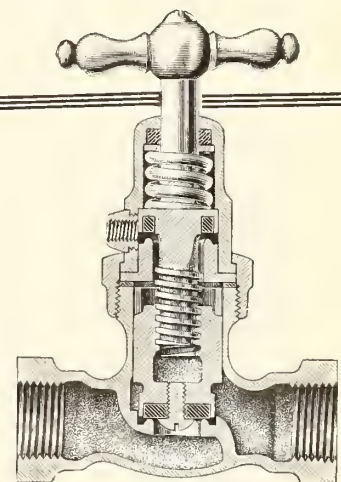
Progressive plumbers everywhere are using MUELLER COMPRESSION S. & W. COCKS, the best thing of the kind ever offered the plumbing trade.

Order some of these cocks for your next job, you'll be pleased with them—so will your customer.

Mueller Stop and Waste Cocks are mechanically perfect. They can't waste until entirely shut off. No pressure passes through the waste hole. Every part is interchangeable—a big, strong point if you should ever need a repair. You're not apt to need it, however — these cocks are built to wear.

They are tested under 200 pounds hydraulic pressure and unconditionally guaranteed.

H. MUELLER MFG. CO., Ltd.
Sarnia, Ontario, Canada



D-8677

S.E.

**H. Mueller
Mfg. Co. Ltd.**
Sarnia, Ont.

Give me further
information and
prices on Mueller
Compression S. & W.

Signed.....

City..... Prov.....

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

Clean-cut pipes, mean easy started threads

and to be able to start your die-stock, quickly and truly, without jamming or running on askew, means time saved on the job and energy not wasted.

So if you're tired of the old wheel pipe-hacker, tired of half an hour's filing after you've done the hacking, tired of a lot of reaming, before the hole in the pipe looks anything like—it's time you invested in a

Beaver Square End Pipe Cutter

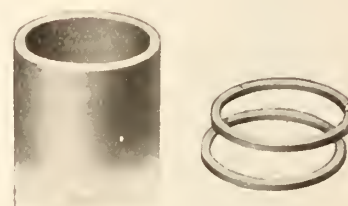
and quit hacking for good.

The "Beaver," cuts off any pipe, within its capacity square, and without burs. To operate it requires a minimum of energy, and after you have closed it in on the pipe it feeds itself. The knives are very easily sharpened, when dull.

Drop in on your dealer, on your way home this evening—and get him to let you cut a piece of pipe with the Beaver.—That's all.

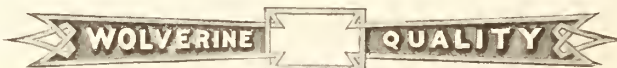


Done With Ordinary Pipe Cutter.



Cut With "Beaver" Square End Pipe Cutter.

BORDEN-CANADIAN COMPANY, Toronto, Ontario



Wolverine "One Piece" Basin Supplies

(Patented)



Separate Wolverine Flexible Joint Connection. Furnished on any $\frac{3}{8}$ -inch I.P. Basin Supply by specifying "C" after figure number.



Lead Cone Packing. Furnished on any Supply instead of Rubber by specifying "L" after figure number.



To receive $\frac{1}{4}$ -inch I.P. Tall Piece. Furnished on any $\frac{3}{8}$ I.P. Basin Supply by specifying "R" after figure number.

Special annealed brass tubing with slip joint nut for $\frac{1}{2}$ -inch iron pipe or with $\frac{3}{8}$ -inch I. P. Thread for floor or wall connections.

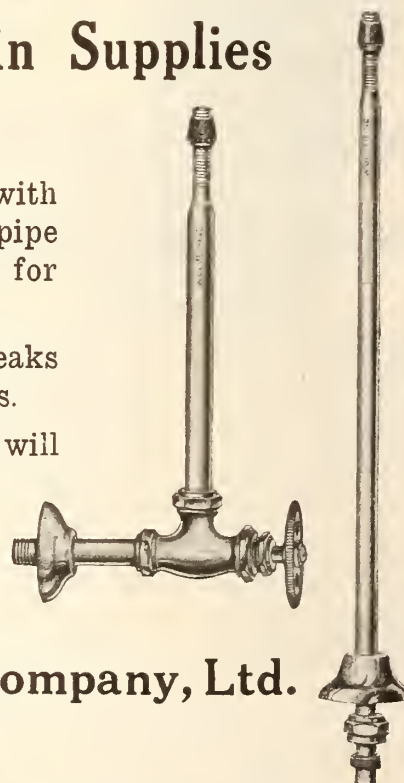
The Flexible Joint eliminates leaks at connections under the basins.

Heavy deep flanges which will not dinge, as is often seen with inferior fittings.

Manufactured by

Canadian Wolverine Company, Ltd.

Chatham, Ont.

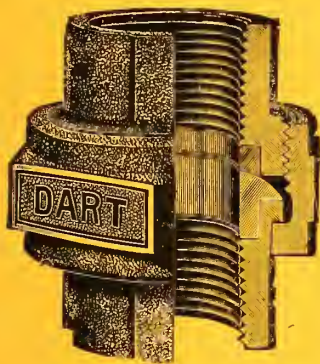


"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

Dart Unions

Make pipe connections at a saving of time and labor.

—and because of their non-corrosive, leakless BRONZE to BRONZE Joint they insure satisfied customers.



All DART Unions have the trade-mark as shown on the cut. We will promptly replace 2 for 1 any Dart Union that is found defective.

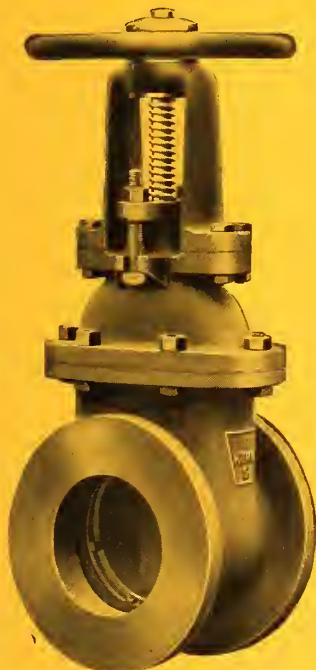
Manufactured by Dart Union Co., Ltd., Toronto. Sold by Jobbers Everywhere.

KERR GATE VALVES

OUTSIDE SCREW AND YOKE

"KEYSTONE" PATTERN

Embody all the latest features



4 1/2-in. and larger

Screwed-in Seats.

Deep Bronze
Bushed Gland
and Stuffing
Boxes.

Full Opening.

Large Diameter
Hand-Wheels.

Solid Wedge
Discs.



4-in. and smaller

Narrow face-to-
face Dimensions

Symmetrical
Design.

Good Material.

Interchangeable
Parts.

Guaranteed
Tested.



4 1/2-in. and larger

The Kerr Engine Co., Limited, MANUFACTURERS
Walkerville, Ontario

TRADE MARK
GALT BRASS

Overflow Tube
Telescopes

Waste Tube
Telescopes



No Time Lost
Connecting

THE

"ADJUSTO"

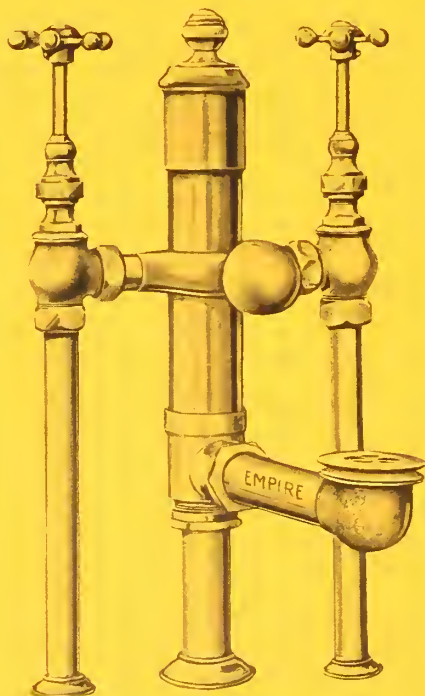
Cast Brass Strainer

Cast Brass Waste Plug

Cast Brass
Coupling Nuts

Manufactured
only by

GALT BRASS CO., Limited, GALT,
CANADA



Sitz Bath Set of Bell Supplies and
Waste

The Figuring of time is al-
ways the Sticker on any job

On any large contracts there is always an allow-
ance made for unforeseen troubles over and above
the possible minimum time.

If you want to minimize this item and add it to
your profits use

EMPIRE PLUMBING GOODS

All our fittings are made to standards and thor-
oughly tested and inspected before leaving the
factory and are guaranteed to fit exactly the fix-
tures they are intended for.

If you have not used them, specify them in your
next order, if you have, we know you will continue
to use them.

Empire Mfg. Co., Ltd.

Head Office and Factory, LONDON, Ont.

Montreal Office, Room 31, C. P. R. Telegraph Bldg,
Winnipeg Office, 109 Carlton Elock, Portage Ave.

THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 701-702 Eastern Townships Bank Bldg.
LONDON, ENG., 88 Fleet St. E.C.

TORONTO, 143-149 University Ave.
CHICAGO, 140 S. Dearborn St.

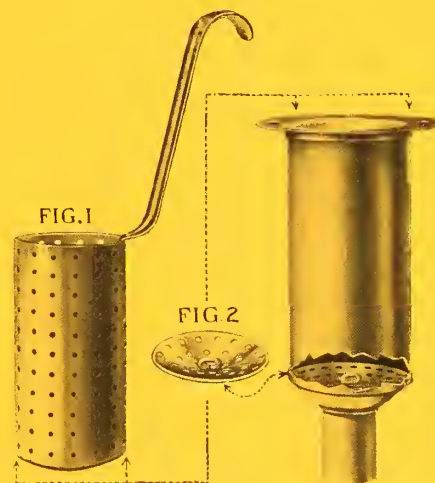
WINNIPEG, 34 Royal Bank Building
NEW YORK, 115 Broadway

Vol. VIII.

Publication Office : TORONTO, FEBRUARY 16, 1914

No. 4

Standard Sdeal SANISTRAINER⁶⁶ - PATENTED -



F-321—18x30 Roll Rim Sink supported on Concealed Hangers, and with Sanistrainer.

LIST PRICE \$14.50

Fuller Bibbs and 1½-inch P Trap as shown, \$5.75 extra. Additional Patterns in preparation. The Sanistrainer represents the most notable advance made in the improvement of Sink Strainers during recent years, and meets the demand for a Strainer that not only strains but also **COLLECTS THE REFUSE OF THE SINK** in such a manner that it can be conveniently removed, without coming in contact with the hands.

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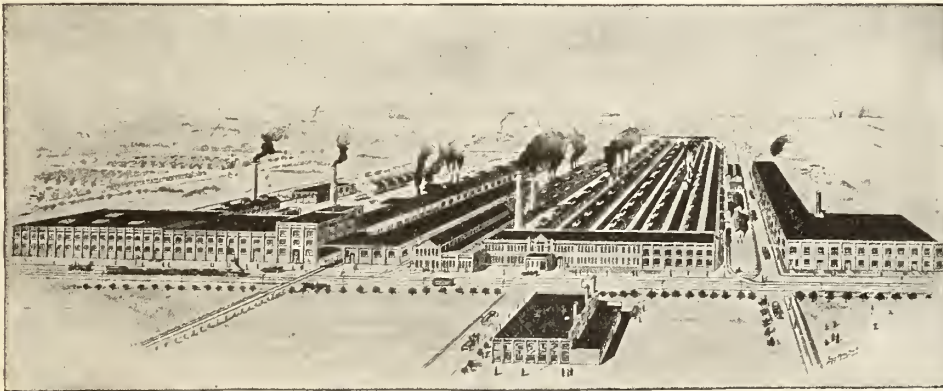
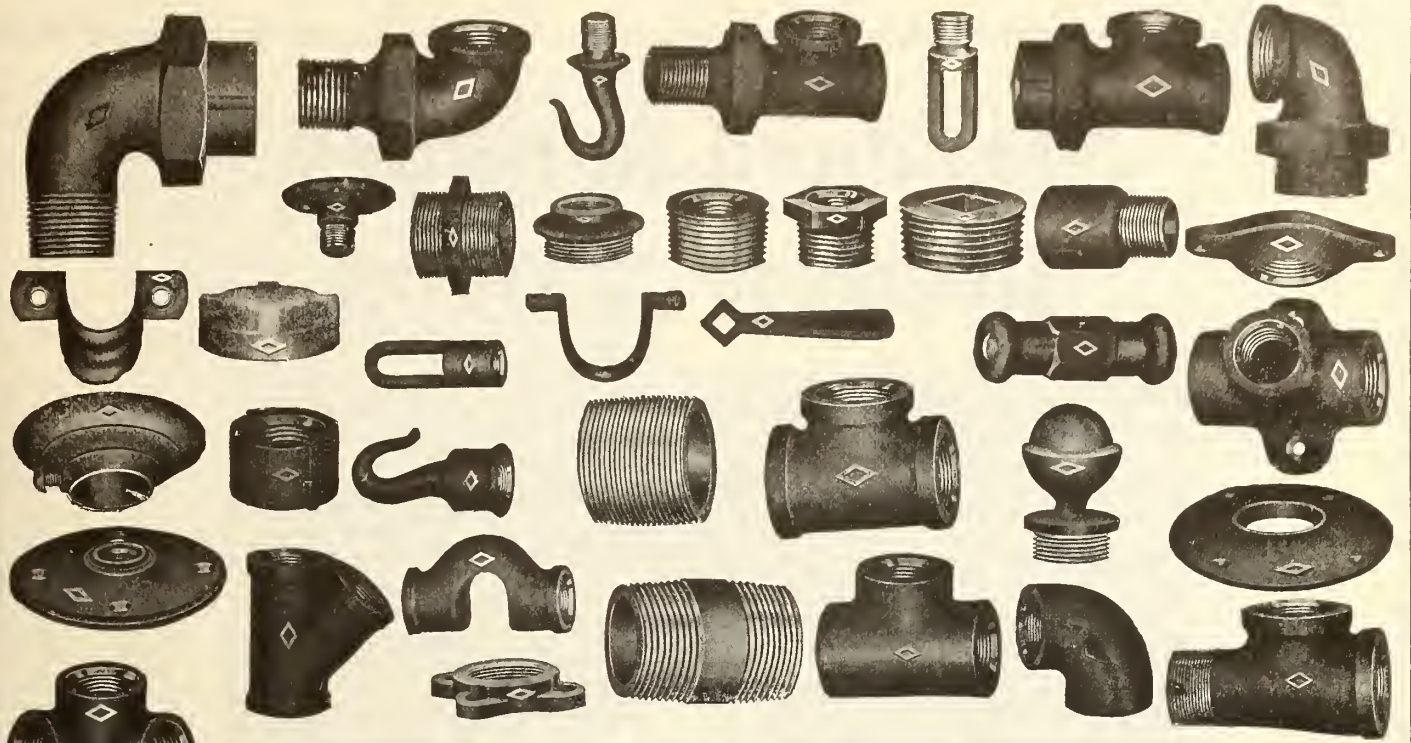
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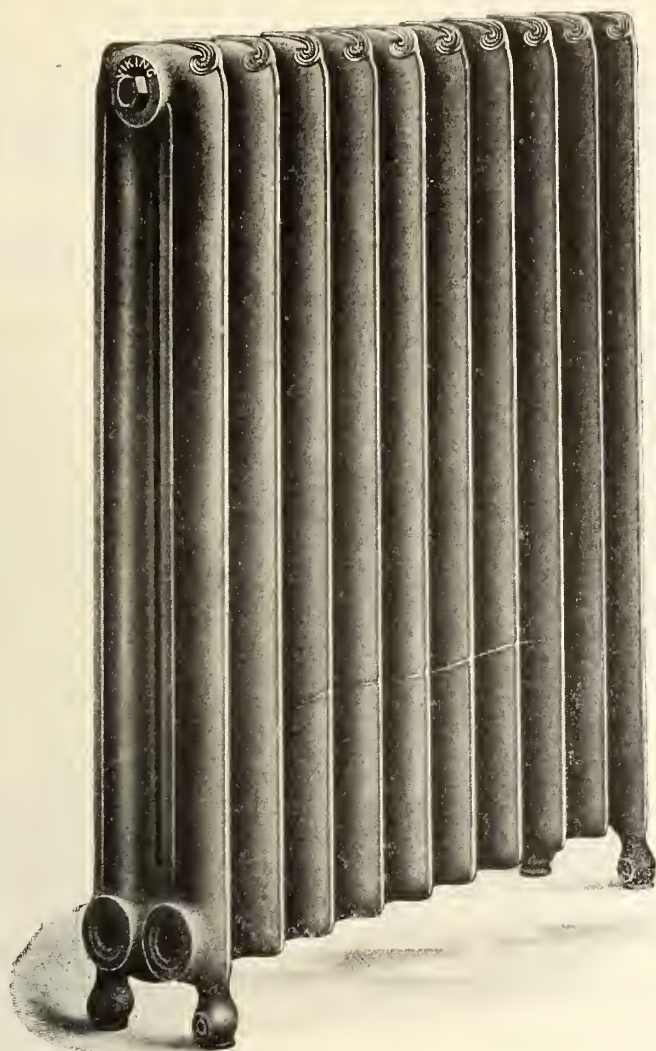
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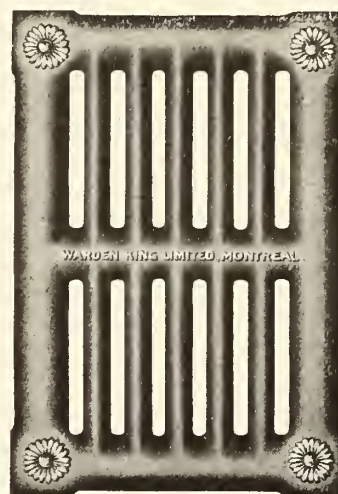


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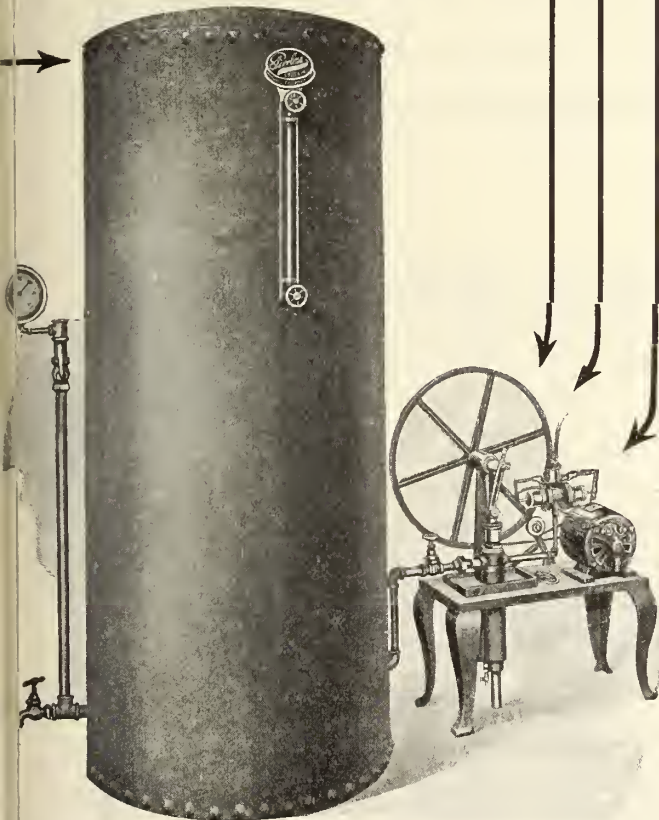
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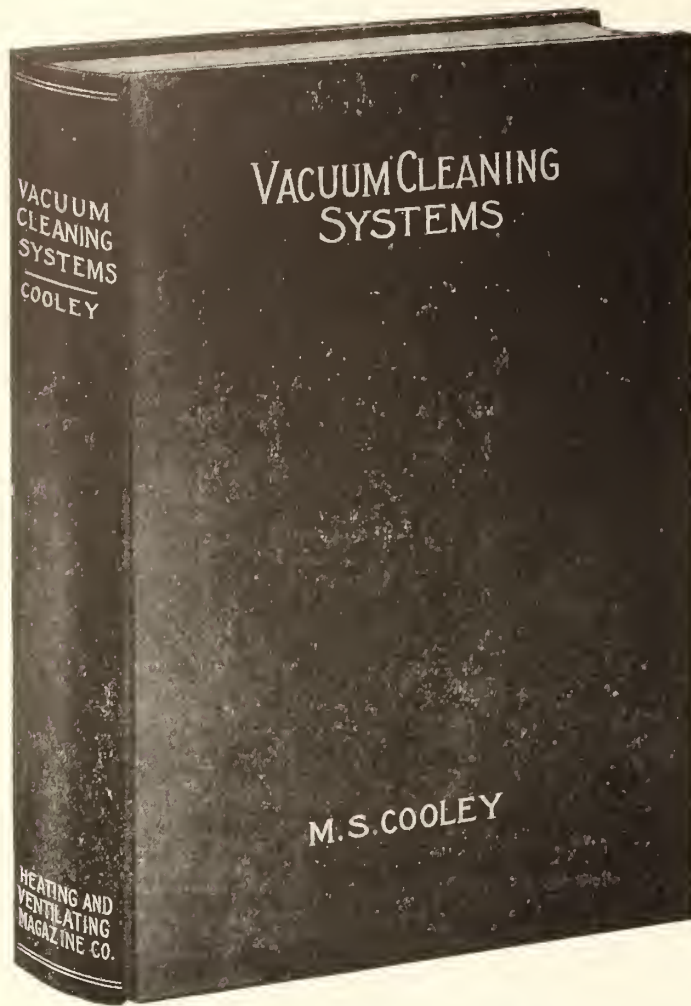
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Vol. VIII.

TORONTO, FEBRUARY 16, 1914

No. 4

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THE SANITARY ENGINEER

VOL. VIII.

FEBRUARY 16, 1914.

No. 4

The Importance of Ventilation in Our Dwellings

An Article Read at One of the Monthly Meetings of the Sanitary Inspectors' Association of Western Canada, Showing the Vital Necessity That Proper Ventilation be Provided in Our Dwellings.

By J. E. Thomas, Sanitary Engineer and Health Inspector for the City of Moose Jaw.

The few remarks that I will make on this subject are merely reminders of the one great fact,—the importance of good ventilation in our dwellings.

I shall take no time at all to dwell on the different methods or any particular system, that would be introduced for the purpose or ventilating, for, in order to do that, figures and illustrations would also have to be introduced.

Records of ventilation by means of bellows and blowers are to be had, by the Romans and later by the Germans. Without doubt, however, the British attempt marked the beginning of ventilation as we to-day understand and use the term.

Probably the first effort to ventilate a room of any considerable size was made by Dr. J. F. Desaguliers, who in 1723, arranged a ventilating apparatus for the British House of Commons. This apparatus was used for upwards of eighty years, being replaced early in the nineteenth century by a system of fans propelled by hand. These fans were arranged to exhaust the foul air at the top of the building.

The early attempt at ventilation was to remove the air vitiated by the exhalations of many people occupying a single room and of the candles or various styles of lamps used for lighting.

With the introduction of the present day type of heating apparatus came the greater need of ventilation in order not only to exhaust the foul air but also to provide a supply of fresh air to replace that vitiated by the breath of the persons occupying a building and also the oxygen consumed by lamps or gas burners for illuminations.

We know that the all important element or quality of the atmosphere is oxygen, and without it we can have neither heat or light. It is necessary to sustain life, for without its presence all living beings would die. Without oxy-

gen, fuel will not burn, for it is required in the chemical process of combustion.

The atmosphere we breathe is composed principally of about one part oxygen to four parts nitrogen, together with more or less vapor, or water in a gaseous state, which is known as humidity. Oxygen is the life sustaining quality of air, which is diffused by the nitrogen.

There is also present in the atmosphere carbon dioxide or carbonic acid gas, which by itself is not so particularly harmful. However, under certain conditions it is detrimental to health, not from the small amount usually present in the air, but when present in larger quantities due to the exhalations from the lungs of several persons congregated in one room. It then produces a feeling of closeness or stuffiness, causing headaches and is otherwise detrimental to health.

The poisonous matter thrown into the air, or given off, by our bodies is also the source of great danger to health; for example,—confine a person in a tight enclosure, that person will live as long as there is oxygen to breathe, depending of course upon the size of the enclosure, the oxygen will eventually be consumed and the person choke or suffocate, being poisoned by the carbonic acid gas and the impurities exhaled from its own body.

If our exhalations are poisonous to ourselves, what then may be said of the risk entailed by living in or temporarily occupying crowded rooms, such as offices, workrooms, or places of amusement even, where we are breathing the foul air exhaled from the lungs of our neighbors, some of whom may be suffering from tuberculosis or other diseases and so contaminate the air with the germs of such diseases.

As another example, enter your own friend's house where a social gathering is celebrated. Enter the house from out-

side where the air is pure into brilliantly lighted rooms not sufficiently ventilated and possibly more or less crowded, a feeling of suffocation is at once apparent. A person not strongly constituted or in good health may in a rather short time faint from lack of air, while a stronger individual may perhaps become accustomed to it and soon fail to notice the oppressing effects of the foul atmosphere of the room.

However, it might be to advantage to remember that the use of electricity for lighting purposes has done much towards maintaining the purity of the atmosphere under such circumstances. That the need of ventilation has long been recognized by physicians, architects and engineers is shown by the several works by the most prominent men treating upon this subject.

It is repeatedly asked what amount of air is necessary for ventilation? This question may be answered by a number of examples. Perfect ventilation might be said to be the exhausting of the foul air and the admitting of the fresh air in such quantities that the inhabitants of a room or building would never inhale the same air twice, or, in other words, would breathe air inside the building of the same purity as that on the outside.

Such a state, however, is neither practical or necessary. With the size and condition of a building and the probable number of occupants known it is possible to estimate very closely the air supply necessary to maintain a certain amount of purity within the building. We know, that not so many years ago a fresh air supply of 30 cubic feet per hour per person was considered sufficient; to-day we look for six times that amount, i.e., 1,800 cubic feet per hour as being the minimum supply essential, even in an office or a dining room. In hospitals we want 3,600 cubic feet per

bed, assembly halls 3,660 per seat, bedrooms and workshops 3,600 per person, theatres and ordinary halls of audience 2,000 per seat.

Last September Dr. Evans of Chicago, during his lecture in the Public Health Convention, told us that within a certain congested area in New York City there were 75,000 consumptives. That there was no question but that this terrible showing is due to the over-crowded dwellings, especially the sleeping rooms, and the workshops, or more popularly designated as sweat shops, where the admission of a small percentage of air would work wonders in the elimination of disease.

The average individual spends one-third of his, or her, life in the bed or sleeping room, how much rest or physical relaxation do we enjoy without the necessary amount of fresh air to breathe? Sleeping rooms should, therefore, be well ventilated and this may easily be accomplished by the thorough airing of the sleeping room during the day, and the opening of the windows at night. By giving the matter a little thought and attention the bed may be so located that no severe draughts are felt by the occupants.

However, to properly ventilate the room it should have its separate pure air supply, tempered by heating and ventilating duct leading from the room to the main ventilating stack of the building.

A building may be properly ventilated only when adequate provision has been made by the architect and builder of such stacks, flues or ducts as may be necessary for the system of ventilation to be adopted. There are two general methods of producing ventilation, namely, natural and mechanical.

However, we are considering the ventilation of dwellings, my remarks must be confined to the former, as the latter is seldom, if ever utilized for buildings used as dwellings otherwise than flats in conjunction with business blocks of large dimensions.

Natural ventilation as expressed and understood is caused by ducts so constructed that the velocity of the outside air or difference of temperature produces a change of air within a building. This method by itself is hardly satisfactory, but when assisted by heating surfaces placed within the exhaust flues and warming the entering air by passing it over or between the heated surfaces of radiators in a manner commonly styled indirect heating, is productive of good results.

The two methods most commonly adopted to answer the purpose of good ventilation are: (1) By employing a main ventilating shaft centrally located in the house, into which foul air ducts from the various rooms should be con-

nected. (2) By utilizing the chimney as a ventilating shaft.

As most modern houses are equipped with a fireplace, the latter method would probably be more favorably considered. However, it must be said, that the importance of chimneys as ventilating mediums is not always recognized. The open fire place, when in use, provides a most successful means of exhausting the foul air from a room.

A chimney or stack may be successfully used by running a smoke flue constructed of boiler iron through the centre of the shaft and surrounding it with ventilating ducts of such number and size as may be necessary to accommodate the rooms to be ventilated. These ducts should rise to the height of the brickwork of the chimney on the top of which these should be erected an iron canopy open at the sides. The smoke flue should protrude through the top of the canopy.

The smoke flue warms and expands the air in the ventilating ducts, inducing an upward circulation which exhausts the foul air from each room and discharges it into the atmosphere outside under the canopy at the top of the chimney.

This method of ventilation, in connection with indirect radiators for warming, is quite successful and by slight modifications may be readily adapted for many small buildings. For residences this is quite a satisfactory arrangement.



FLOURISHING INDUSTRY IN MEDICINE HAT.

Medicine Hat, Alta.—What is considered one of the most important and significant events in the history of manufacturing in Medicine Hat, is an accomplishment recently brought to a successful issue by the original, and yet the largest industry here. The Alberta Clay Products Co., Ltd., has at last successfully solved the problem of manufacturing what competent engineers and experts assert to be the highest grade of sewer pipe.

The importance of this accomplishment can be realized when it is remembered that this company — Medicine Hat's original industry — with its capital of \$700,000 was originally established here primarily for the purpose of turning out sewer pipe. Some three years or more ago, the concern started operations and since that time many thousands of dollars have been expended in attempting to find the right clays for sewer pipe and then in testing this product, but up to a short time ago, such efforts had not proved entirely satisfactory.

Meantime, when it was found that the right clay had not yet been brought to the plant for this purpose, more atten-

tion was given to the manufacture of hollow block, tile and brick. There being an enormous demand for this building material, it was made and shipped by the hundreds of carloads to every large city in the Prairie Provinces, the capacity of the plant being about 5,000 carloads per annum.

Last May, Mr. Richard P. Stewart was engaged as general manager of the concern, and at once turned a large share of his attention to the purpose for which the plant was originally constructed. Finally the company secured a clay, which when mixed with the clay from the company's Dunmore holdings, has been found, by actual practice, to be eminently suitable for the purpose intended, with the result that to-day the Alberta Clay Products Co. is turning out what Mr. Stewart states is the highest grade of sewer pipe. Having been in the practical end of the sewer pipe business for years in Iowa, Mr. Stewart knew exactly what was required and proceeded to secure it, with the result above mentioned.

The company has already made sewer pipe varying in diameter from four inches to twenty-four inches, and, inasmuch as there is no plant of this kind in operation in Canada, west of the Great Lakes right down to the Pacific coast, it can easily be seen what the market for this product will be. Having investigated the market, Mr. Stewart makes the statement that he is confident that by operating the plant at the rate of ten hours per day—and it is usually operated on double this time—he can supply all the sewer pipe needed in the Prairie Provinces, and thus secure the greater bulk of the trade in this commodity, not a little of which is now imported from the United States, having a duty of 35 per cent.

When the Alberta Clay Products Co. is running at its usual twenty hours per day capacity, it is possible to turn out 200 tons each twenty-four hours of hollow ware and pipe. During the year 1913, there were manufactured approximately 45,000 tons of these various products, the pressed brick department alone having a capacity of 12,000,000 per annum. When running at normal capacity the plant employs about 200 men. The clay that is being used in the sewer pipe manufacturing is brought a distance of some 400 miles, and is another evidence of how far raw material can be brought to Medicine Hat to be economically manufactured through the medium of Medicine Hat natural gas.

For the past year or two, there have been dozens, if not scores, of men who were more or less interested in clay working, who have prospected and scoured the hills and valleys within several hundred miles of Medicine Hat.

Soil Pipe Terminals: Their Importance and Location

Read at the Monthly Meeting of the Canadian Institute of Sanitary Engineers, Showing Their Importance and the Necessity of Their Proper Location.

By William Fairley, Plumbing Inspector, St. Boniface, Man.

AT the recent meeting held in Winnipeg by the local members of the Canadian Institute of Sanitary Engineers the above subject was the theme of discussion.

At first glance the subject of pipe terminals will seem to many not to be worthy of much consideration; in fact, some sanitary engineers think that so long as they get the terminals of soil waste and vent pipes through the roof to the outside air, it does not matter much in what position these outlets are located. Personally I am of the opinion that this question is most important when it is taken into consideration that pipe terminals hold the key to the successful operation of all sanitary engineering and drainage systems; and, again, when it is considered that the aim of the sanitary engineer from start to finish of a job is to prevent the ingress of sewer or drain air into the building. Yet in many cases the terminals of these pipes project through the roof in close proximity and on a level with windows on the same or adjoining buildings.

Present Laws Inadequate.

The requirements of some ordinances that terminals be located at not less than ten feet from a window are inadequate. I am of the opinion that all pipe terminals connected directly with the plumbing or drainage system should be located at the peak or highest point on a roof, and in all cases should be carried above windows or other openings which have communication with the inside of the building. Climatic conditions in Western Canada render it necessary that all terminals of soil waste and vent pipes which are four inches or less in diameter should be increased at least two sizes larger before passing through the roof.

Fresh Air Inlets and Main House Traps Condemned.

With regard to so-called "fresh air inlets," which generally terminate near the ground level, and often in close proximity to doors and window. Instead of being fresh air inlets, these are often foul air outlets, and as such are dangerous and a nuisance, and in my opinion the sooner they and these obstructions or traps which they serve are prohibited

the better it will be for everybody, with the possible exception of the sanitary engineers who install them.

Another important phase of this subject is the liability of pipe terminals to



WM. FAIRLEY,
Plumbing Inspector, St. Boniface,
Man.

freeze over in winter, the cause of this being the warm moist air from the drains or sewers condensing and freezing over the outlets. In Western Canada, and especially in the Province of Manitoba, this trouble is most acute, probably owing to the fact that our cold spells last

longer without a break than in any of the other provinces. In any case, when the winter season comes round the old trouble of frozen terminals comes with it, and, of course, the evils which arise from such a condition, the siphonage of fixtures, traps, etc., etc., then the complaints of bad odors, etc., from the uninitiated to the Health Department.

Number of Experiments Made.

Several devices have been experimented with to overcome this trouble, but so far none have been a complete success. The City of Winnipeg adopted a special roof flange constructed of galvanized sheet iron with a double casing, the outer casing being ten inches in diameter and the inner casing eight inches, the space between being packed with mineral wool; but so far this has not met with the success hoped for.

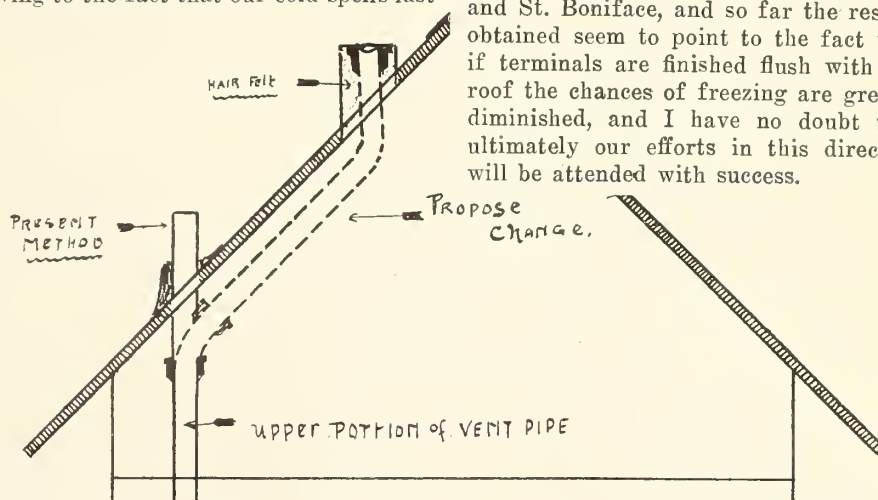
Some of the devices that have been suggested are as follows:—

An inverted Y branch and cleanout placed below roof line and accessible from the interior of the building.

A water supply connected to the stack near the summit and controlled by stop-cocks placed in a convenient position.

An electric coil placed near the terminal and regulated by a switch in the interior of the building, etc., etc.

The objections to these devices are obvious, inasmuch as none of them are automatic and depend upon the occupants of the building for their manipulation. At the present time experiments are being carried on by the Plumbing Inspection Departments of Winnipeg and St. Boniface, and so far the results obtained seem to point to the fact that if terminals are finished flush with the roof the chances of freezing are greatly diminished, and I have no doubt that ultimately our efforts in this direction will be attended with success.



A suggestion which appeared in a recent issue of Sanitary Engineer.

The Sanitary Engineer

Plumber and Steamfitter of Canada

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TORONTO, FEBRUARY 16, 1914

PRACTICE versus THEORY.

TO read those words used in our heading and in the way we use them is scarcely good logic. What is meant by such a statement is that theory without practice is lacking a something, the practical fan without theory is almost as undesirable as the one with theoretical knowledge and not the practical experience. We are at this day beginning to see that the most in demand is the one who has acquired both the practical and theoretical. Theory and practice go hand-in-hand, else something will suffer. The great disasters, such as the Quebec bridge, and numerous others were cases where theory held sway without practice, though in a sense, progress demands such calamities, because we learn that such experiences are practical ones. We learn that such certain strains cannot be put upon a structure of the same build and design, hence we alter our theory. Theory is not versus practice, they must, as we stated before, go hand-in-hand.

THE CRAFT NEED MORE EDUCATION.

ONE of the main reasons why our water supplies are polluted is because we, as sanitary engineers, have been lacking in foresight, in education, in practical theory, else we who have installed the plumbing or sanitary conveniences, would have sounded the note of caution.

We would have voiced an opinion that it was and is dangerous to pollute our rivers, lakes and streams. We are in many a sense to blame for conditions as we find them.

RECEIVE INQUIRIES ABOUT CESSPOOLS.

JUST recently Sanitary Engineer received an inquiry as to the size of a cesspool, method of construction, and how far it would be necessary to be placed from a house. This question to come from a sanitary engineer at this date cannot help but make us feel that a great deal of improvement is necessary along theoretical lines by those of our craft.

Such an instance reminds one that our practice requires a theoretical jolt, as no theory on sanitary lines ever justified a cesspool. Mother Nature is our best friend in matters of sanitation; the septic tank can only do its best work and give best results when set to work in harmony with Nature's laws.

THE LICENSE QUESTION.

THIS is a subject which should be brought before our city authorities in more forceful form than is being done at present. Those engaged in the work of sanitation and heating, as well as ventilating engineering, should take the matter up in their shops with the men, and in that way educate them to see the importance of their calling. Ask them to devote more time to study, and encourage them in any way possible, so that in the event of the city authorities bringing into force thorough examinations your men will be successful, and be better fitted to keep pace with the several progressive strides which in these days sanitary engineering is taking.

STUDY SOURCES OF WATER SUPPLY.

THE problem of domestic water supply is one which sanitary engineers should be interested in. Methods of sewage disposal should be studied more so as to prevent our water supply from becoming polluted. The city of Ottawa is about to spend millions of dollars on a new water supply system simply because she is polluting her supply which lies at her very door. Other towns are doing the same, and no doubt if these cities would spend their money in preventing the pollution instead of tying up millions of dollars in a something which will be costly beyond all reason, they would be making a move in the right direction.

UNIFORM CODE REQUIRED.

THE Ontario Society of Domestic Sanitary and Heating Engineers are taking steps along such lines, and at some future day expect to approach the provincial authorities with a view to adopt some code which would enforce better sanitary conditions in our towns and villages.

These towns and villages will be cities in the near future, hence the necessity that work of a sanitary engineering nature should be up-to-date. There is no reason in the world why a village should be made filthy by installations of a poor class any more than a city, and some stringent law governing these installations, along with reasonable examinations for journeymen, as well as employer who actually does the work of installation.

THE HEATING PROBLEM.

SINCE our last issue reports from the press show that several lives have been lost, as the results of defective furnaces. We do not think the actual trouble lies with the furnace, but rather with the way it is installed. A large number are too small for the area which they are expected to heat, thus causing the household to endeavor to raise the heat too quickly, and proper combustion does not take place. We are strongly of the opinion that the heating of our homes should be under the jurisdiction of some expert engineers, thus safeguarding the lives of the people and at the same time catering to the comforts of the home. We would hail with delight any move made by our boards of health in this direction.



EDITORIAL COMMENTS.

The true spirit of civilization is to be industrious.



Every reader of Sanitary Engineer is eligible for membership.



Ask us about the new Sanitary Engineer's Debating Club which is being formed.



Read the advertisements in Sanitary Engineer. They are the finger-post to good buying.



Watch for the first Spring Number of Sanitary Engineer. It will be the largest number ever issued.



Don't forget the Ontario Convention of the Domestic, Sanitary and Heating Engineers which will take place March 19th, 20th and 21st.



If you would be successful in your business you must co-operate with your journeyman and he with the apprentice. Then co-operate.



If you wish to have the true spirit of co-operation permeate throughout craft, every member must be loyal to himself, to his fellow competitors and to his workmen. Then be loyal.



The Business Situation

BUSINESS during the past week with hardware, stove and metal merchants has been fair for this season of the year. The volume of business passing at present is not large, but too much should not be expected during this season of the year. The outlook for spring business is good and booking for future has been heavy. There is a decided improvement in the metal market. Stove manufacturers, although quiet at present, are booking good orders for spring delivery. The Financial Post, commenting on the Business Outlook stated as follows:—

In every part of the Dominion trade and commerce during the week have been inclined to quietness, but underneath this inactivity there is hopefulness born of the easier money conditions at capital centres. Though day-to-day money in London, as reference to our cable will

indicate, is available for the time being at less than one per cent., and although money at New York is relatively as easy, there are no immediate signs of drooping commercial rates in Canada. During the week brokers have been able to get some accommodation at 6 per cent., as compared with 6½ a week ago, but the amounts available for this purpose are not large. Not too much credence can be placed in statements to the effect that there is abundance of money at 6 per cent., especially at Montreal. Some private lending has taken place, producing the appearance, temporarily, of an abundant supply. We are not yet, however, satisfied that it would be good policy on the part of the banks to place too large a proportion of their funds at call in Canada, nor is it at all probable that they will be able to do so. Their reserves are none too strong. After a period of anxiety they will very naturally incline towards the comfort and ease which strength in cash resources give them. They are, however, confronted with the imminence of heavy borrowing in London, where new issues are already causing some concern, and with the imminence also of a crisis in Mexican affairs. Moreover, reports from Brazil during the week have not been reassuring, nor have those from Paris. Trade in Britain is being maintained, and there also commodity prices appear again to be ascending. Here, therefore, are factors which are not conducive to continued monetary ease.

To forecast the probable course of business is made more difficult by the developments of the week. January bank clearings and those for the current week show a very decided falling-off, and for the first few weeks of the year the decline in the issue of building permits is very marked.

Rolling stock of the railroads is to a greater extent becoming unemployed. These particular circumstances indicate dullness, and also a very cautious attitude on the part of business, despite the bold front which published opinion clothes it. No doubt, as we have already stated, there is a healthy underlying hopefulness, which is fully justified by the actual easing of money rates at capital centres.

The decline in building may safely be attributed to the period, now happily past, during which the procuring of loans was a hopeless task, and bank clearings have contracted as a result of the elimination of speculation, largely, but not wholly, in real estate. Commerce will have a better chance to revive if the speculation referred to does not return; and, in so far as the building situation is concerned, the availability of money will tend from now on to stimulate activity. In Eastern Canada the demand for 7 per cent. mortgage money is still strong, and on central property on low percentage of valuation 6 per cent. and even 5½ per cent. money can be got. But it is the supply of the higher-priced money, available for the needs of the home-builder, that concerns business men most. As yet we do not discern any signs of an adequate supply becoming available for some time. Conditions in European centres are changing, and it is quite probable that before midsummer our more influential agencies will be able to place large amounts of debentures at a rate that will enable them to supply borrowers at rates prevailing at the beginning of 1913 and in 1912. There will not be any trade buoyancy until we have these conditions.

Don't forget to attend the Ontario Convention
March 19, 20, 21.

Processes Necessary to Complete a Common Globe Valve

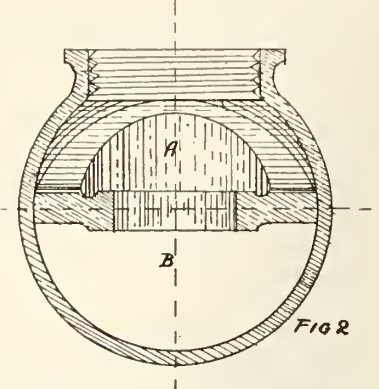
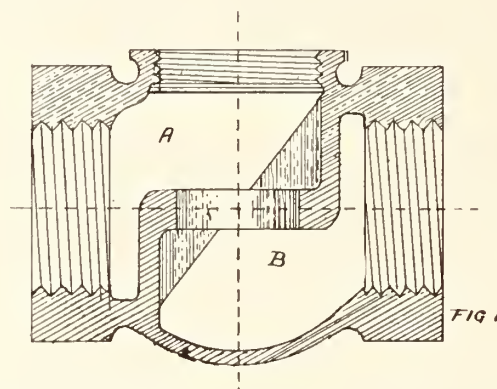
A Series of Articles Showing in a Simple Way the Operations Required to Complete a Nickel-plated Globe Valve—Following the Steps From the Drafting Office to the User.

In December 15th issue of last year we began an article under the above heading and will now continue same. We showed the necessary steps which were taken from the drafting office and were just taking up the matter of core boxes. Referring to the core boxes necessary for the body of the valve, to make these requires great skill and no second-rate man can turn out a set of core boxes accurately. They must be made in two sections and fit each other perfectly. By glancing at Figures 1 and 2 it will be seen the reason why two sections are required. These core boxes are the most particular portion, because of the fact that any unevenness in them would result in the metal of the body being uneven in thickness. The same care must be taken with them regarding the number of shrinkages. In case a large quantity of cores are to be made, the wooden core boxes are first made, allowing for the shrinkage, so that when metal ones are moulded from them, the latter will be the size required.

It may be here stated that when it is known at the start that metal patterns, or match plates, and metal core boxes are required, the wooden patterns are known as master patterns, thus making known to the mechanic that the necessary shrinkages have been allowed for.

Before going further, we will glance at Fig. 3. This is a view of the wood pattern for the body of the valve. Note the parts marked X. These are known as core prints and are placed in such a way as to hold the core in place after the pattern has been moulded.

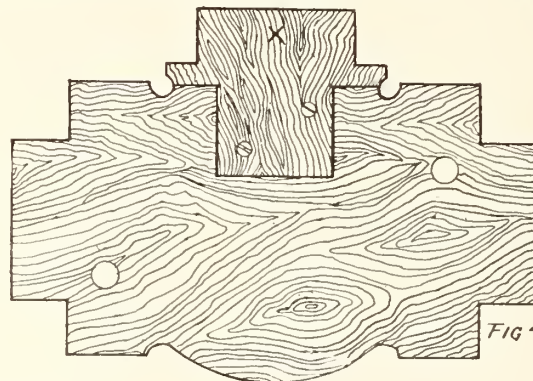
Figs. 4 and 5 show one half pattern of body, which, of course, is made in two halves. If these patterns are to be made



up on match plates, half patterns would be moulded and fastened on plates. We will take up the method followed out later on.

In Fig. 6 we show the two cores as they should appear in the mould. The two cores A and B, to be known as the

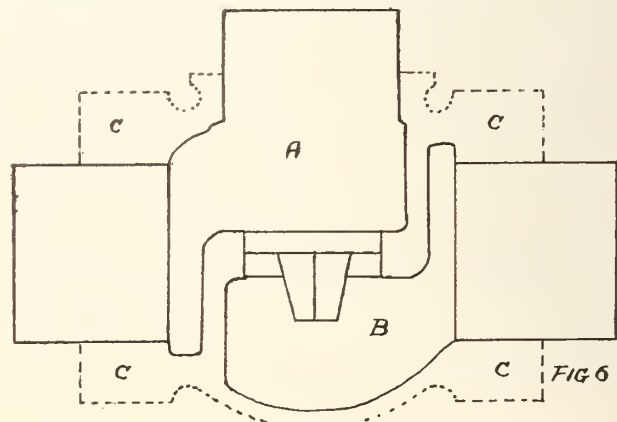
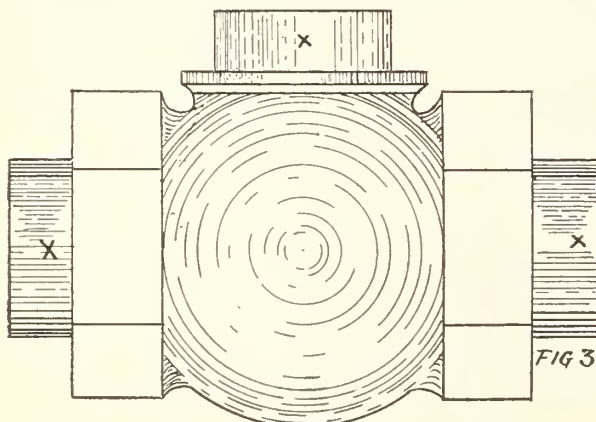
idea of the need for absolute accuracy, and when we note the amount of work there is embodied in the making-up of a common globe valve, those who use them, or rather install them, should never fail to take all the care possible, so that these goods should give good satisfaction. The



inlet and outlet cores are made to fit together by coring a centre print on A and allowing a cavity in B. C.e.c.e. shows the space in the sand which will be filled by the molten metal. We will turn to Figs. 7 and 8. These are the two core boxes and show by the dotted lines the shape of the cores in a rough way. No doubt very few in the craft have any

idea for which we are writing this article is to show our readers, whom we know are users of this class of goods, the need of proper care being taken when installing them.

In our next issue we will take up the pattern work and core boxes for the bonnet stuffing box, etc., as well as the pattern for the handle.



(Core boxes continued on page 22.)

Analysis of Canadian Sanitary Engineering Bylaws

In Our Recent Issues We Have Taken up Several By-laws, Viz., Ottawa, Montreal, Toronto and Calgary—We Will Now Comment on the Plumbing By-law in Force in Fort William, Known as By-law No. 1,181.

THESE articles have proved to be of such interest that we have decided to take up these topics continuously, we feel that our readers will then be able to compare the chief clauses and the comments made upon them, with those in force in their own city. This by-law is now in operation in Fort William, Ont., and is known as By-law No. 1181.

CLAUSE 1.

This clause merely states that an application for connections from the house drain to the main sewer, must be made on a properly prescribed form, and under the direction of the city engineer.

CLAUSE 2.

This is more novel in many ways than others recently commented upon and is very definite. We repeat it herewith:—

Before proceeding to construct, re-construct, alter, or extend any portion of the drainage, or plumbing, or any part thereof of any house or building, the owner or his agent shall make application to the plumbing inspector or another authorized official for a permit therefor, such application to be accompanied by a specification or abstract of the proposed work.

In buildings having more than five fixtures, viz: — W.C., bath, basin, sink and wash tubs, a plan shall be required with the application, showing the location and size of house drains with any traps, inspection pieces or clean-out screws, that may be thereon, and a section showing the vertical soil pipes, with all the branch connections thereto, as well as all the necessary ventilating pipes.

With the filing of such plans or description a deposit of one dollar (\$1.00) shall be made for each stack, remodel, alteration, or addition to cover the cost of inspection and entering records.

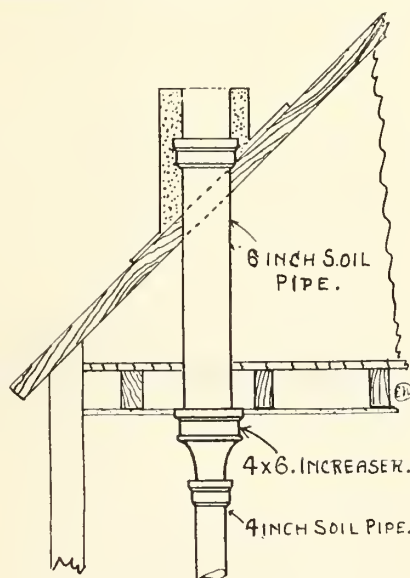
Several sentences in this clause are very clear, while others are not.

For instance, in the first part of the clause it is stated, that an application must be made to the plumbing inspector or some other authorized official, before any work be done to any part of the drainage or plumbing. It does not however, state that a deposit shall be

made for such permit being granted except in the latter part of the clause where it mentions, that a deposit of one dollar must be made, where more than five fixtures are to be installed. It then not only demands a deposit but also asks for plans and specification to be provided. It probably, however, was intended that one dollar should be deposited for "alteration, remodel or additions," as is shown by the following final sentence:

With the filing of such plans or description a deposit of one dollar shall be made, etc., etc.

We are of the opinion that this fee should be charged for every permit granted.



The trade, too, should co-operate with the board of health in every possible way to prevent alterations however small, even when it is a question of the reconstruction or installation of only one new fixture. We all know that where an old closed-in bath is removed and a new one replaced, there is often a difference in the position of the outlet, and many a time the trap is of a poor make, and is the worse for wear, but the new bath is installed by bending the waste or straining the bend of the trap to make it come in line with the new bath waste. Such a case often happens, and results in a poor, as well as an unsanitary job. This clause at the beginning states "That the owner or his agents' shall make an application, etc.,

and, almost every town or city plumbing by-law contains the same clause. Now, it could be greatly improved by striking out the word "agent," or else by making it clear that the plumber doing the work would not be allowed to take out the permit, this opinion was voiced several years ago for the following reasons:

Every town or city in Canada, with the exception of one or two, have a lot of poorly qualified men, who are engaged in the work of installing plumbing doing repair work and installing odd fixtures. These men do not always take out a permit when they should. They evade the law in a moral sense, because the legal sense is not quite as rigid as it might be, and many a time it is to save the dollar. Now if the law demanded the owner or his agent (excluding the plumber as such) the health authorities would know what was going on, before any work was permitted to be done. Such a course would prevent a lot of work being done by unqualified men and in the end would be a boon to the public welfare. It would also prevent good work from being added to poor or old work which would not stand the tests necessary to bring it up to standard.

Just at this moment the writer has a job in mind where a quantity of new fixtures were installed and the waste pipes were not disturbed in any way, except that the openings at the floors were twisted to different positions to fit the new fixtures, the lead work must have been in for 25 or 30 years. The soil pipe was light and heavily tarred, the joints were all old style over-cast ones, yet this work was put through without the authorities knowing of it.

Now let us state right here that if sanitary engineering is to be brought to a good standard, such installation should be made a criminal act.

It is like putting new wine into old bottles. Similar incidents are occurring every day somewhere in this Canada of ours. Hence we feel that a change should be made and would be a step in the right direction.

CLAUSE 3.

This clause is general and requires that after a permit has been granted, no change can be made in the plan except by consulting some authority.

CLAUSE 4.

This is an important clause hence before we comment upon it we will ask our readers to look it over:

House drains must in no case be less than four inches in diameter and may in no case exceed six inches except by special permission. They must be laid on an even grade in a straight line and have a fall to the outlet of not less than one in forty. (if possible.)

Where a change of direction is necessary, proper bends or junctions must be used, and no tributary, or branch drain shall join at right angle.

Drains may have either direct connection with the sewer, or, have an intercepting trap with cleanout screws just inside the external walls.

If the latter method is adopted, provision must be made for fresh air inlet to house side of trap, and ventilating of sewer by ventilating pipe carried up outside the building.

Every sentence of this clause is of an important nature, is practical and goes far to maintain a high standard in sanitary engineering. No doubt the use of soil pipe less than four inches in diameter, is inadvisable for a house of say three or four fixtures. Just as great care should be exercised when choosing a large size pipe. Many a plumber has erred by using too large a size, and when such has been the case, the pipe would not be self-scouring. Years ago the plumber would never dream of using less than 2-inch lead waste for an ordinary kitchen sink, but now experience has shown that 1½-inch gives better satisfaction under ordinary circumstances.

Another important portion of this clause is where the intercepting, or main house trap is optional, and that when a trap is used a breather must be provided. It will be interesting to our readers when we tell them that the sanitary engineers in Fort William use the best form of house drainage, viz., the direct connection to the sewer, and though main house traps are optional, only one has been installed in four years and that one, four years ago. Such a course reflects great credit to all engaged in the craft, and in this respect Fort William sets a good example, not only to the younger cities but also to some of the older cities, whose authorities ought to know better. But the fact is those who do insist on a main house trap being installed are being carried away by an old time-worn prejudice. They have always installed them and can't see why they should not.

We only know of one condition which justifies the use of this much talked of trap, we refer to the city of Winnipeg, and even there it would not be used if

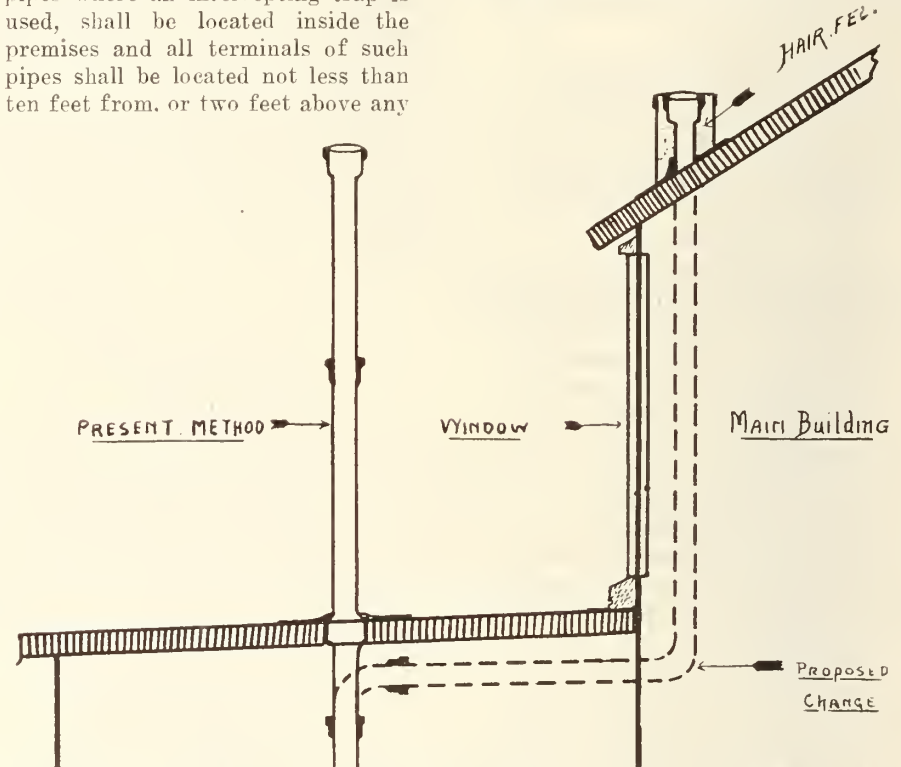
there were any other means of preventing the freezing of branches where the house drain is connected to the main sewer. We feel that eventually Winnipeg will find out some remedy for this and thus again dispense with the use of the main house trap, at the same time doing away with the objectionable vent or breather.

CLAUSE 5.

This clause deals with the terminals at the roof, which is usual, and is embodied in almost all by-laws. But there is an important amendment which practically rescinds the old clause, we here reproduce it:

All soil, waste or vent pipes, with the exception of sewer ventilating pipes where an intercepting trap is used, shall be located inside the premises and all terminals of such pipes shall be located not less than ten feet from, or two feet above any

This amendment or clause as it now is, goes to show that in Fort William they have adopted a good method in not allowing a long length of vent pipe or stack terminal to be exposed to the atmosphere. It will be no information to some of our readers to know that in some of our largest cities, there are conditions where as much as 20 feet is exposed, and in these same cities it is common to see 10 feet of soil pipe extending upward, even though the temperature has been as low as 16 below zero, and in some cities we know the temperature drops down to 32 below zero, yet no change in their by-laws have taken place. The writer knows where as many as ten men out of sixteen during cold spells have been engaged in thaw-



Unsightly and unsanitary method adopted in several Canadian cities.

window or other openings in the same or other adjoining premises in existence at the date of the permit for the installation of such pipes and no such pipe terminals shall project or be exposed for a greater length than six inches above the roof.

All terminals of soil, waste and ventilating pipes shall be increased to six inches at the ceiling line before passing through the roof of the premises.

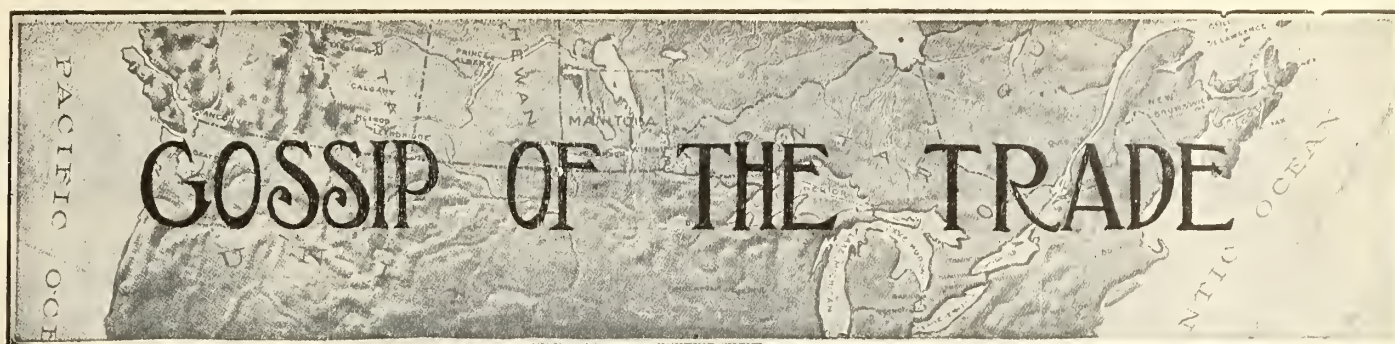
If stack has got to be offset, the offset shall be made with eighth or sixth bends.

Extensions of soil or vent pipes must not finish against a gable or discharge into a light well.

When sewer connection is made to dwelling or business premises, at least one closet and sink must be installed.

ing out these terminals, yet no move is made. Such conditions go to prove that a uniform code would be a boon.

It is strange that such conditions should exist, but they do. To see such lengths of soil pipe towering upward a few feet from a dormer window is not attractive, to say nothing of the poor practice which it is. Hence when we see a clause embodied in a by-law which does not allow these unsightly as well as unsanitary spectacles, it does one good, and also reflects credit upon the craft in that city as a whole. The matter of increasing all terminals is good practice. It is also good practice to have the increaser placed at the ceiling line instead of close to or within a few inches of the rafters in the roof. In Fort William they find by placing increaser at ceiling line, the hoar frost plug falls and is very soon melted by the greater heat than if placed higher up.



NEW COMPANY TO BE FORMED.

St. John, N.B.—The approach of spring sees many hopeful signs with regard to industrial progress and activities in the Maritime Provinces and various firms are planning business development. Plans were recently laid before the city commissioners for a manufacturing plant on the Marsh Road, involving an outlay of \$2,000,000, by George McAvity and A. P. Barnhill, the plant to give employment to about 1,500 men. A request was made for a fixed rate for a period of forty years, the company undertaking to pay \$5,000 in taxes each year if the request were granted. Mr. Barnhill said it was the intention to form a new company to take over the McAvity business and enlarge it, and that the capital for the new concern was already assured. The initial unit of the plant to be erected on the Marsh Road would cost about \$300,000, while extensions contemplated would make a total expenditure of about \$2,000,000. The company desires the right to rail connections with the I.C.R. with a level crossing, and to supply electric light, power and telephone service, and to carry wires to its buildings on either side of the road. An agreement in the matter will be made at a later date.

Port Arthur.—A fire occurred recently in the establishment of Joseph Barnes, sanitary engineer, situated at 243 Park Street. The fire is said to have been caused by an overheated stove; but was quickly extinguished with chemical fire equipment, very slight damage being done.

Regina.—Harry Reid, of the Regina Heating and Plumbing Co., has returned home after a visit to a few of his friends in the East.

Saskatoon is considering the appointment of a permanent medical officer of health. The council are almost unanimous in their choice. It is now a matter of salary.

In passing, we feel that such should not be the case, providing the man they have in view is thought to be suitable. In all walks of life there are too many

who are short on salary. The man who can fill such a position should be one of our highest paid officials, and cities all over Canada are beginning to see this matter in the same light. Many cities have been too meagre in the salaries they have voted as sufficient for their medical health officer, and in almost every case such positions have been both small on salary and man.

Alderman Dr. Young showed his big heart when he volunteered to keep an eye on Regina's health. We hope to hear of Regina appointing a sanitary engineer on their board of health, if they have not already done so.

PLUMBERS ASK FOR PROTECTION.

Medicine Hat.—The licensing of journeymen plumbers formed a live topic of discussion at the Trades and Labor Council meeting recently. The plumbers do not particularly object to being licensed, but they, along with other crafts, do object to the manner in which license fees are being collected—by the city police. If they are to pay licenses, they feel that they should get some protection from the city. They feel that, in like manner to the electrical workers, there should be a municipal examining board, and that their organization should have one of their members, a practical man, on the board. They also wanted to know why two or three trades were singled out for licenses, while the carpenters, masons and others do not pay license. The matter was placed in the hands of the municipal committee, who will take prompt action in investigating.

ADDITION TO PLUMBING BY-LAWS.

Regina.—The plumbing by-law has been revised and very few additions or amendments will have to be made to this piece of civic legislation, but a few changes may be expected in the regulations dealing with the disposal of garbage to meet new conditions created by the erection of the new transfer station and the location of the incinerator out at the sewage disposal works.

PASSED NECESSARY EXAMINATIONS.

Winnipeg.—P. Pickering, Douglas Douglas Little, and Officer Sturgess, of the Health Department, have been successful in passing the examinations submitted by the Royal Sanitary Institute in order for them to become inspectors of nuisances. These were held in October. P. R. Tustin, of the department, made the announcement recently.

SAY PLUMBING BY-LAW IS BEING VIOLATED.

Nelson, B.C.—Declaring that the city plumbing by-law in some of the large buildings in the city was not being complied with and that all plumbers should be compelled to observe the provisions of the measure, the British Columbia Plumbing Company and R. T. Hayden & Co. wrote to the city council last night. The matter was referred to the public works committee for a report.

A GROWING CONCERN.

Oshawa.—Mr. W. D. Muekler, who recently moved his plumbing establishment to the new Everson block, now has one of the most up-to-date plumbing shops in town, at 42 Simcoe Street N., where he occupies the whole ground floor and basement. The ground floor is handsomely fitted up as an office, where sanitary devices and sanitary supplies of all kinds are displayed. The whole of the basement is used as a workshop, and is fitted up in first-class manner.

DR. BENTLEY'S HEALTH TALK.

Parkhall.—Medical health officer, Dr. Bentley, gave a Health talk and illustrated lecture in the own Hall on Tuesday, afternoon and evening. There was a large attendance of children in the afternoon, and in the evening the hall was packed, not even standing room being available. The moving pictures, illustrating the life of a fly from the laying of the eggs, all through the

(Continued on page 22.)

The Wolverines

From Co

High Grade Brass Goods



No. 1



No. 2



W. S. WINTER,
Asst. Secretary
NELSON B.

Brass Goods that are different in design and high in quality is our aim and our product shows it.

A trial order will convince you that the Wolverine is the line for satisfaction and good profit.

Canadian Wolverine Company

re on Your Trail

to Coast

Unconditionally Guaranteed

ER,
and Sales Manager

The advertisement features a map of Canada with three dogs (No. 4, No. 5, and No. 6) and portraits of three men (No. 1, No. 2, and No. 3). The dogs are positioned in the western, central, and eastern parts of the country. The portraits are placed near the dogs. The map includes labels for various regions and bodies of water, such as Baffin Bay, Davis Strait, Hudson Strait, Labrador, Atlantic Ocean, James Bay, Quebec, Ontario, Superior, Lake Ontario, Lake Erie, Toronto, Montreal, Ottawa, New Brunswick, Nova Scotia, and St. John's. The text 'Unconditionally Guaranteed' is prominently displayed in the center.

No. 4 QUEBEC

No. 5 NEW-FOUND-LAND

No. 6 ONTARIO

No. 1 E. T. Needham, B.C. and Alberta

No. 2 C. H. Bakemeyer, Man. and Sask.

No. 3 J. J. Cornelius, Western and Northern Ontario.

No. 4 W. H. Darling, Toronto, Hamilton and Eastern Ontario.

No. 5 H. M. Dunn, Montreal and Eastern Provinces.

Limited, Chatham, Ontario

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

GOSSIP OF THE TRADE.

Dr. Bentley's Health Talk.

(Continued from page 19.)

maggot and carval states until the fly was back again on the meat to repeat the process of reproduction, were illuminating. Seeing is believing and some of the audience had their meat appetite somewhat spoiled for a day or two. The teeming life in a drop of water was somewhat of a surprise to many and the next attack of indigestion we get we shall doubtless imagine that the hoop animal or the other fellow with claws like a cricket is responsible. Dr. Bentley stated that he has found colon bacilli in many of the wells used for drinking water in Western Ontario. These breed typhoid fever and are found in the wells because barns and conveniences used by the family are too close to these. Dr. Bentley visited some of the stables from which milk is supplied to the town; also the slaughter houses and those engaged in the sale of fresh meats. He urged those present to see that the town is cleaned up.

NEW APPOINTMENT.

Brockville.—Frank P. Hart, son of Mr. and Mrs. Patrick Hart, Daniel Street, has been selected by the board of water and light commissioners as street foreman of the water department in succession to Chas. Noyes. Mr. Hart is a practical and experienced plumber, having been a member of the firm of Brown & Semple.

FURNACE DEFECTIVE.

Toronto.—Deadly coal gas nearly claimed three more victims during Monday night, when Mrs. E. Saunders, Mrs. Madden and Mrs. Griffiths, 25 Beaconsfield avenue, were all discovered unconscious in their beds at an early hour. After an all-night attempt at resuscitation, the first two were removed to the Western Hospital, where they are reported to be in a serious condition. Mrs. Griffiths is still at her home, but is also very low.

A defective furnace is blamed. Saunders frequently has had men working at it to stop the flow of noxious gas.

CORRECTION.

In a recent issue we published an announcement that F. W. Smith, formerly of the Shirley Radiator & Foundry Co., Indianapolis, had been appointed general manager of Steel and Radiation. Ltd.

Mr. Smith, however, informed us that such is not the case and desired us to make the correction.

TWO NEW APPOINTMENTS.

E. T. Needham has been recently appointed the representative for the Canadian Wolverine Company, Ltd., Chatham. The district he is to cover will be British Columbia and Alberta.

Ed. Needham is a Toronto boy and



E. T. NEEDHAM.

for nine years has carried on business as sanitary and heating engineer. He has always been an active worker in the Toronto Association of Domestic Sanitary and Heating Engineers. All who know Ed. will be sorry to hear of him



H. M. DUNN.

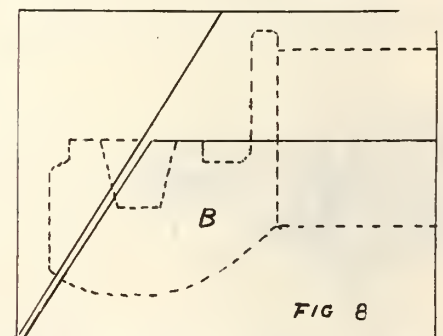
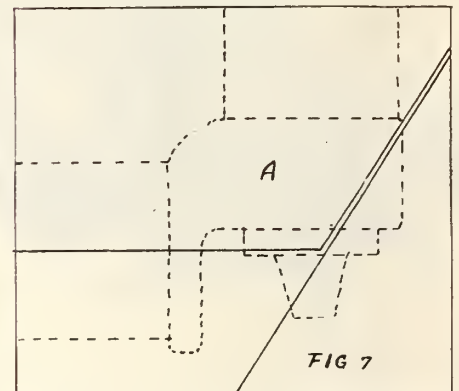
leaving Toronto. His family will follow him to British Columbia at a later date. "Sanitary Engineer" joins with all his friends in wishing him every success in his new venture.

H. M. Dunn is another of our friends who has been allotted a position with the Canadian Wolverine Company, Ltd., Chatham. He resided in Toronto, and for over two years was the city repre-

sentative of the Colwell Lead Co., Ltd., of Detroit. He is well known to the trade and is well liked. Mr. Dunn will represent his firm in Montreal and eastern provinces, making Montreal his headquarters.

Sanitary Engineering at Harvard University.—Four new courses are offered by the Department of Sanitary Engineering of Harvard University. One will deal with the study, preparation and interpretation of vital, social and sanitary statistics, with special emphasis laid on the application to public health. Another deals with the principle and practice of sanitation and hygiene as applied to the farm, at the summer resorts, in camps, etc. The third course is for students who have never studied bacteriology and who wish to gain a general understanding of the relation of bacteria to the processes of nature, to chemistry, to sanitary science, and to health. A fourth course for specializing in government and business administration deals with the principles of municipal sanitation and sanitary engineering, with special reference to their administration in cities.

Winnipeg.—The Winnipeg Metal and Heating Company has taken on another title and will be known in future as the Empire Metal & Heating Co.



Illustrating core boxes in article on page 16, referring to the manufacture of a common globe valve.

"Shop Economics"—A Talk With Boss, Journeyman and Helper

Showing Where Savings Could be Made, Where the Boss Would Save, Journeyman Earn, and Helper Learn, by Adopting the Right Method at the Right Time.

If there is one thing more than another which some of our craftsmen lack it is neatness in the layout of their work. For instance, what looks worse than a nice high-back lavatory with a neat apron poorly installed? Not hanging true, and not level, with the waste

simply with a view of knowing how to put in a neat and well-balanced job.

To bring this subject more to our readers' notice we are reproducing three views all of practically one installation. We always feel that a drawing or picture of an installation speaks more to one's mind than a whole lot of reading. Just look at Fig. 1. It has the look of a poor job, which it is. Fig. 2 is the same job put in properly, and there is no reason in the world why it should have been installed as shown in Fig. 1. If the same mechanic had been told to rough it in for a wall waste outlet, as in Fig. 3, he would have got it in the centre. But because the waste has to run to the floor it is placed, as shown in Fig. 1, in at least 25 out of every 100 cases.

We would strongly urge that every journeyman be supplied with a book of roughing-in measurements, and that each employer demand more neatness. All the beautiful fixtures in the world do not make a neat job; in fact, just the reverse is the result. We have a case in mind where a building has been remodelled into offices, and where each office was supplied with a separate lavatory. Every one of these lavatories

cept the lack of neatness. It stood the tests as far as durability, but in these days a neat installation is cheap advertising.

The public are becoming more educated in matters of sanitation; they are better able to judge when a job looks

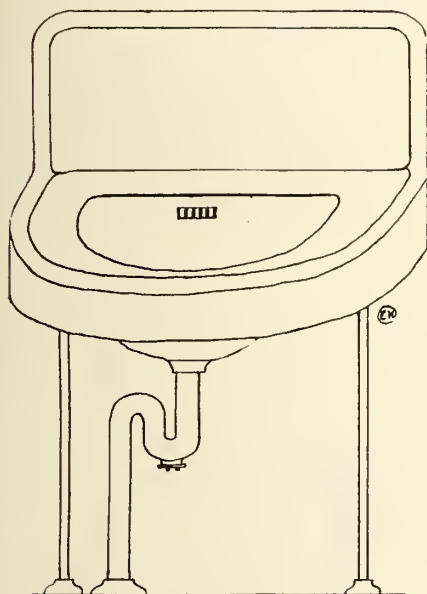


Fig. 1.

outlet jammed up close to one of the supplies. In years gone by, when a fellow had to carry every roughing-in detail in his hand, one could be excused once in a while, as all traps were not the same measurement, centre to centre, neither lead or brass. When manufacturers supplied no measurements, etc., etc., there was some little excuse; but here we are in these days, when every possible detail can be had for the asking, manufacturers are spending thousands of dollars in books of roughing-in details, standardizing their goods and scores of other things so as to assist our craftsmen to put up a neat job. Some of the catalogues and hand-books, both for the sanitary and heating engineer, are not only works of art, but also a source of unlimited education. It really is a treat to peruse one of these books, all of which are supplied free on application. The writer well remembers the day when to get a look at one of these books was a great favor, and when he spent scores of hours and "midnight oil" copying out and making sketches of roughing-in measurements, etc.,

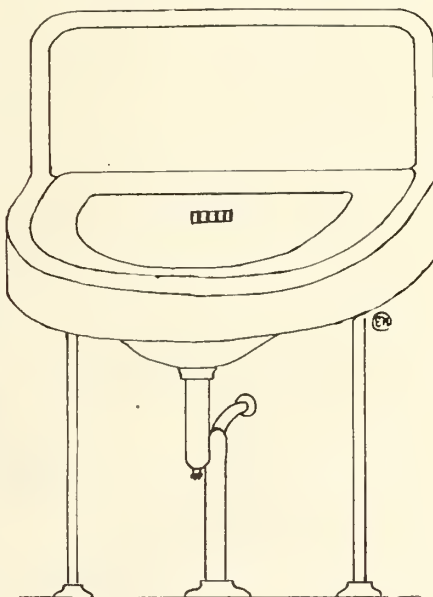


Fig. 2.

were installed as shown in Fig. 1. Needless to say, no name plate was attached to that job, and no wonder. The actual work was all that could be desired, ex-

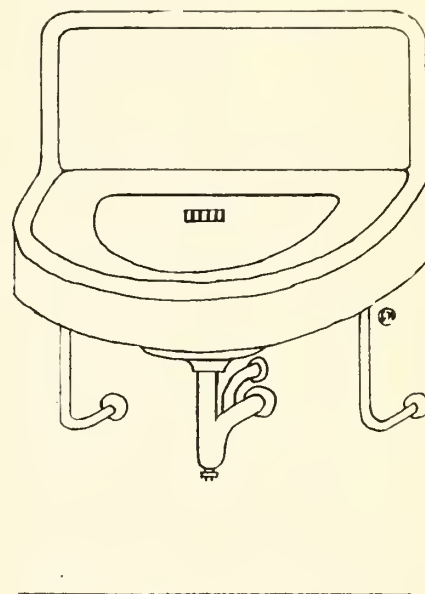


Fig. 3.

well, hence we would again ask that more neatness be studied along such lines, and in the end this will bring cumulative benefits to the sanitary engineer.



NEW SEWERS, ETC., FOR REGINA.

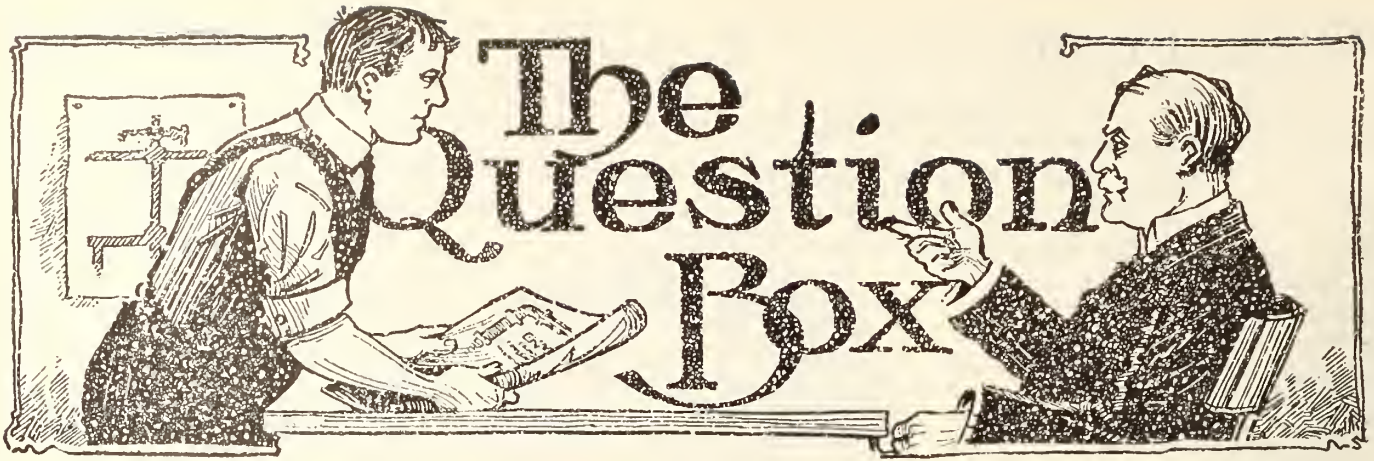
The total cost of the domestic sewer and water distribution extension for this year's programme is approximately \$270,000. The water distribution extensions total \$127,752, and the domestic sewer extensions \$142,000.



TO FIGHT TYPHOID.

Medicine Hat, Alta.—A by-law is being prepared by the health authorities of the city to reduce the death rate from typhoid.

Dr. Orr, medical officer of health, said that at the present time Medicine Hat has had altogether too many cases of death from typhoid.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

Editor Sanitary Engineer.—Kindly allow me space for a few remarks, concerning the often-discussed question, relating to the connection of bath and basin wash pipes to lead closet bend.

In your issue of Jan. 1st last, a sketch is shown of two lead waste pipes branched in to a w.c. bend, and the question is asked as to what is wrong with said connection. You reply that when w.c. is flushed, the lead bend will fill, causing syphonic action to take place, etc. You also that "there are very few cities in Canada to-day where branching into lead bend is tolerated." I agree with you in stating that in such connection should be allowed, but not in particular for the reason you give. The practical or mechanical objection to the connection is that in nearly all cases the fixtures connecting into lead bend, discharge both hot and cold water into same, which sets up an unequal expansion and contraction, and which in time causes disintegration of the lead, especially at the edges of the branch joints and also at the edges of four-inch joint between bend and ferrule. This causes a break or leak, which is a very difficult and expensive one to repair, especially if the bath room is tiled.

Another practical objection to this connection I might mention is, that sometimes the w.c. and bath are placed very close together, the bath trap being wiped directly into lead bend. In a case of this kind, often when the w.c. is flushed a certain amount of matter from w.c. may back up into bath trap, contaminating water in said trap thus causing an offensive odor. Of course if bath were used daily, possibly nothing would be noticed, but when Saturday night is the weekly scrub time it will be, and the writer has traced certain mysterious escapes of so-called "sewerage" to the above cause. In my opinion the lead

bend and brass ferrule connection for w.c. should be abolished as it is one of the weakest if not the weakest point of present day plumbing practice.

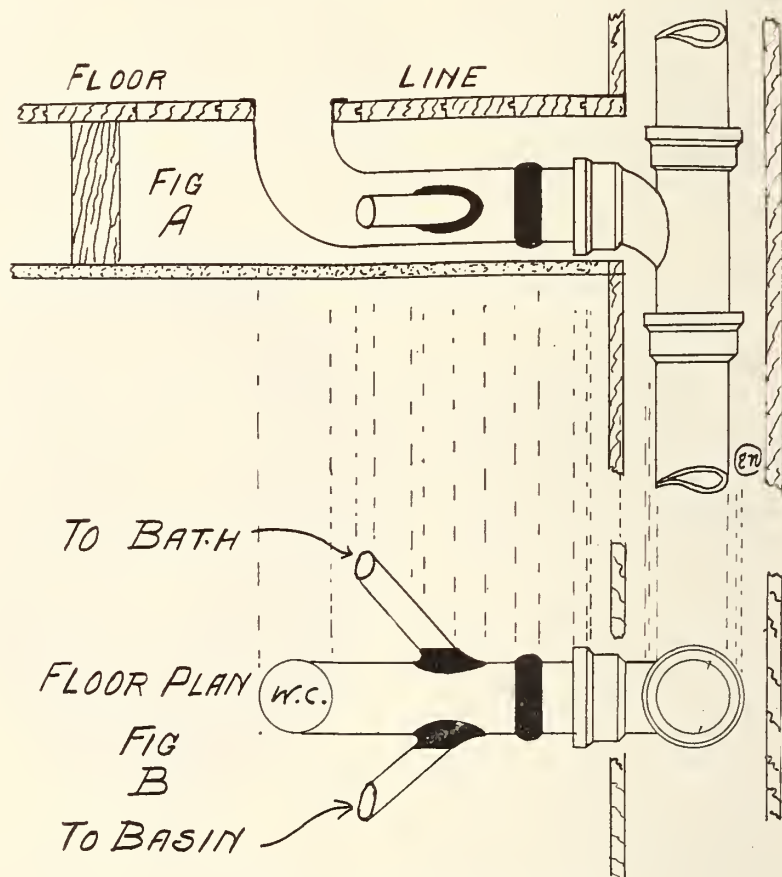
Respectfully yours,

U. A. T.

liable firm manufacturing cement laundry tubs. Thanking you for an early reply.

Yours truly,

R. McG. Coyle,
Chatham.



Sketch referred to by W. A. T.

WHO MANUFACTURE CEMENT LAUNDRY TUBS.

Editor Sanitary Engineer,—I would appreciate it very much if you could furnish me with the address of some re-

Replying to above inquiry we beg to state, that cement laundry tubs are manufactured by the Toronto Cast Stone Co., 1379 Yonge St., Toronto; also the Roman Stone Works, 1060 Yonge St., Toronto.

NEW CANADIAN PATENTS

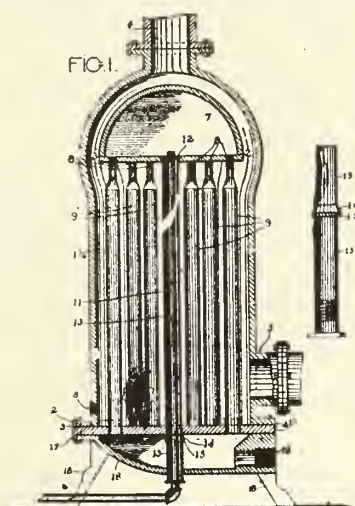
Stewart Allison Scott, Dunedin, New Zealand, 16th September, 1913; 6 years. Filed 30th September, 1912. Receipt No. 214,953.

Claim.—1. In combination, a valve chamber, a ball valve movably mounted therein, a float actuated lever fulcrumed to said valve chamber, and a short prising lever pivoted to the aforesaid lever and adapted to engage said ball valve and prise it from its seat.

2. In combination, a valve chamber, a ball valve movably mounted therein, a float actuated lever fulcrumed to said valve chamber, a gland removably seated in said chamber and provided with an inlet passage, and a short prising lever pivoted to the aforesaid lever and fulcrumed on the wall of said inlet passage, the free end of said prising lever engaging said ball valve to prise it from its seat.

3. In combination, a valve chamber, valve guides therein, a ball valve in said chamber and fitting snugly between said guides, a foot actuated lever fulcrumed to said valve chamber, a gland removably mounted in said valve chamber and provided with an inlet passage, and a short prising lever pivoted to and operated by said float actuated lever and fulcrumed

described comprising an outer shell provided with inlet and outlet openings, a heating dome, a base plate, heating tubes connecting said dome and base plate, means for securing said base plate



No. 150,568. Water Heater.

to said casing with the dome and tubes inside the casing, and means for delivering steam to the interior of said dome.

2. A heater of the character described comprising an outer shell provided with inlet and outlet openings and having a bulbous enlargement at its upper end, a steam dome of substantially the same diameter as the inner diameter of the body of said shell and adapted to be arranged within said bulbous enlargement, a base plate, steam tubes, connected to and communicating with the interior of said dome and connected to said base plate, and means for delivering steam to said dome.

3. A heater of the character described comprising an outer shell provided with inlet and outlet openings and having a bulbous enlargement at its upper end, a steam dome of substantially the same diameter as the inner diameter of the body of said shell and adapted to be arranged within said bulbous enlargement, a base plate, steam tubes, connected to and communicating with the interior of said dome and connected to said base plate and having reduced upper ends, and means for delivering steam to said dome.

4. A heater of the character described comprising an outer shell provided with inlet and outlet openings and having a bulbous enlargement at its upper end, a steam dome of substantially the same diameter as the inner diameter of the body of said shell and adapted to be

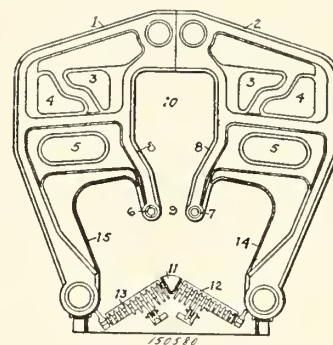
arranged within said bulbous enlargement, a base plate, steam tubes, connected to and communicating with the interior of said dome and connected to said base plate, means for delivering steam to said dome, and a circular dished exhaust head connected to said plate.

* * *

The Spencer Heater Company, assignee of David Boies and Joseph A. Waddell, jr., co-inventors, all of Scranton, Pennsylvania, U.S.A., 23rd September, 1913; 6 years. Filed 14th April, 1913. Receipt No. 223,234.

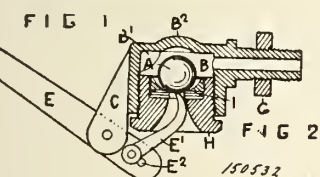
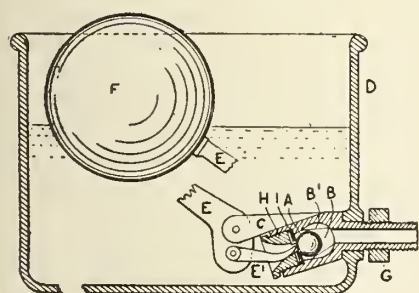
Claim.—1. A unit for a sectional boiler comprising two sections, the inner wall of each having a recess and a depending water leg, said leg and a part of said recess being disposed at an angle to the vertical, whereby when the sections are brought together in a unit, the recesses and water legs form a fuel magazine with a restricted opening.

2. A boiler furnace comprising an inclined grate, a fuel magazine above the high portion of the grate, and a combustion chamber over the main body of the grate, said magazine and combustion chamber being constructed of hollow boiler sections, each comprising an inner wall formed with a recess providing one side of the magazine, and inwardly inclined water leg depending therefrom there being a suitably related opposite magazine wall, and said water legs being disposed at an angle to form a constricted fuel outlet from the magazine pre-



No. 150,580. Sectional Boiler.

sented toward the high point of the grate, said boiler section also having an outer wall presented downwardly and inwardly to provide the outer wall of the combustion chamber, and located to leave between it and the inwardly inclined water leg, a combustion chamber located over the main body of the grate.



No. 150,532. Ball Cock.

on the wall of said passage, the free end of said prising lever being adapted to engage said ball valve and prise it from its seat.

* * *

The Harris Construction Company, Limited, assignee of Joseph William Guimont, both of Montreal, Quebec, Canada, 23rd September, 1913; 6 years. Filed 30th May, 1913. Receipt No. 225,031.

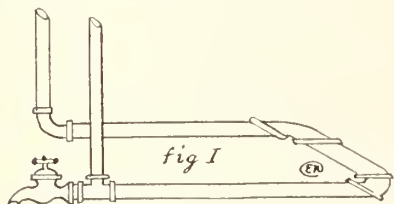
Claim.—1. A heater of the character

Domestic Hot Water Supply Problems

A Series of Articles Dealing With the Problem of Hot Water Supplies, Range Boiler Connections, in Various Forms, and Methods Adopted as a Means of Heating Water Under Various Conditions.

ARTICLE 2.

UR concluding remarks in last issue referred to the necessity of avoiding any undue friction, quick bends or burred pipes when making these hot water supply connections. Before taking up any particular style of heaters, coils or water fronts, let us further show



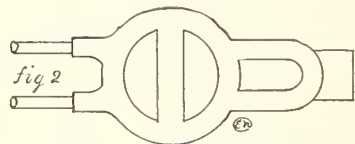
another reason why some systems do not always work.

For instance, if a coil has been made of, say, 1-inch pipe, which may be of brass, copper or galvanized iron, as shown in Fig. 1, or a heater, Fig. 2, and it is to be installed in a furnace situated in the basement or cellar, then a long run of piping is necessary to enable the connection to be made to a range boiler in the kitchen above..

The reason for this sluggishness has been accounted for by the fact that a certain amount of expansion of column of water has been taking place, as shown in Fig. 3, in both the lines of piping, thus having a heavier body of water at the terminus as it were—viz., the range boiler, circulation has been retarded to such an extent that little or no results have been gotten.

The writer has in mind some experience he had with such connection which were made in the way shown in Fig. 1. He was asked to remedy the system as best he could, and went about it as follows:—

First, finding that a run of 30 feet of horizontal pipe was in use—i.e., each pipe was 30 feet, making 60 feet in all—which, it may be stated, was fairly direct, the remedy adopted was to make

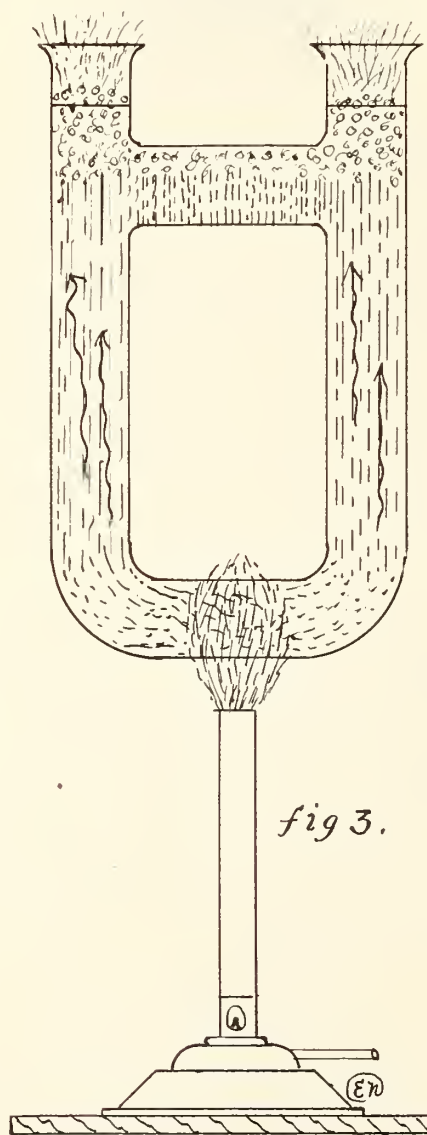


a trap, as seen in Fig. 4, by placing an elbow looking downward on the pipe which was connected to the bottom of the boiler and inserting 6 inches of pipe into it, then a 3-in. nipple and tee, and then connected it up in the ordinary way to the boiler. This worked so satisfactorily that a whole terrace of houses

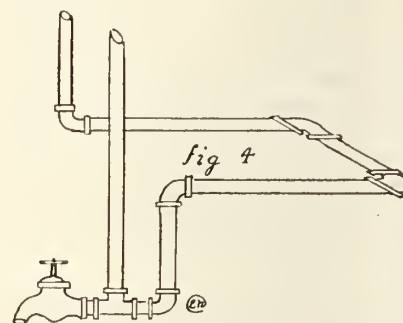
had their connections altered, though, strange to say, while there were six houses in the terrace, all exactly alike in every way, one out of the six was giving satisfaction before the alteration was made. We are showing in Fig. 5, on page 27, what action really took place by the alteration made.

First, please note that these coils or heaters were run across the top of the fire pot, in a flat level position, and both the pipes were being heated on the same level, just as can be seen in Figs. 3 and 5. Thus, by adding a trap on the return it practically altered the relative position of the heat, and in that way created a motion in the pipes.

Many fitters have been at a loss to solve problems of this kind, and no doubt



a little thought along theoretical lines would help them out of their trouble. Another feature which is often overlooked, and which causes a great deal of trouble and annoyance, is when a heating engineer is told that a large quantity of water is likely to be required, a larger size of heater is installed and small



mains are connected to it, resulting in two or more things happening, which does not become apparent until a big fire is put on. A noise of boiling water and a rumbling sound all over the house is heard, particularly when water is drawn off at one of the taps. There is also an element of danger when such happens, because the moment a tap is opened cold water displaces the hot taken out, and the portion of water which is in the coil or heater is also displaced by colder water, many a time causing a leak in either coil or heater, whichever happens to be in use.

Hence we would strongly advise that when a larger heater is necessary it is always good practice to add a certain quantity of larger size pipe near to the heater, or even run it all the way to the boiler.

On the other hand, if a coil is in use, another remedy can be adopted when more water is wanted, and that is, to add more of the same size of pipe to it.

It may be stated that there is almost unlimited scope for the use of coils and auxiliary heaters, and in large shops, almost every day, some one calls in to see if heat can be utilized in the heating of water, both for supplying the domestic needs of the kitchen or bathroom, or when a laundry equipment is being added to the home. Nearly each and every case has local conditions to be dealt with, such as passing under and over window frames or doors, passing through cold storage compartments and

(Continued on next page.)

Toronto Association Hold Their Annual "At Home"

The Most Successful Event Held for Several
Mayor Hocken Sends His Delegate.
Year — Was Entirely Formal — His Worship

The most successful, and pleasing "At Home," which the Toronto Society of Domestic Sanitary and Heating Engineers ever had took place Jan. 30th last. It was expected to have had the presence of his Worship Mayor Hocken, but pressure of business made it impossible for him to attend, however, Ald. Ryder acted as his able delegate, and expressed the Mayor's regret at being absent.

President J. T. Aggett introduced Ald. Ryder to those present and gave a hearty welcome to one and all. The evening was then opened to enjoyment with a grand march, which was led off under the able direction of Bro. Geo. H. Cooper, who officiated as floor manager.

There were about 300 persons present including members and their wives, daughters and friends. Several supply houses and manufacturers' representatives were present, amongst whom were:

Mrs. T. B. Smyth, Mrs. F. Gentle, Miss Clarke, Mrs. W. Boddington, Mrs. G. H. Cooper, Mrs. Mackinnon, Mrs. J. H. Warwick, Miss Sheppard, Mrs. Kirtley, Miss A. J. Jones, London; Mrs. and Miss W. Mansell, Miss Quinn, Miss May O'Donnell, Ottawa; Miss May Fullerton, Mrs. C. H. Quinn, Mrs. F. Quinn, Mrs. J. E. Fullerton, Mrs. J. T. Aggett, Mrs. Geo. McQuillan, Mrs. W. G. Downs, Mrs. W. H. Benson, Mrs. Geo. Clapperton, Miss L. M. Dearing, Mrs. H. J. Pell, Mrs. A. F. Passmore, Mrs. O. H. Sparling, Mrs. G. F. Clare, Miss H. J. Cowie, Mrs. R. M. Yeomans, Mrs. A. H. Read, Mrs. W. C. Coulter, Miss Cecilia Lees, Miss M. E. Dalby, Mrs. E. J. Williams, Miss L. Sherlock, Miss E. Jacobs, Mrs. J. R. Seager, Mrs. F. E. Ellis, Mrs. H. Durham, Mrs. Andrew Wright, Mrs. R. Wright, Mrs. E. L. Ayre, Miss C. Case, Mrs. Powers, Miss Young, Mrs. W. Miles, Miss Lily Healy, Mrs. W. C. Schultz, Mrs. W. G. Foster, Chatham; Mrs. J. Sherlock, Miss E. Taylor, Miss Carmen De Vilbiss, Miss O. Markle, Miss L. Hass, Miss O. Canuiff, Miss E. Bryne, Miss B. E. Hewitt, Miss Myrtle Stewart, Mrs. W. Hemphill, Mrs. F. R. Maxwell, Mrs. H. G. Waterman, Miss Ada West, Miss M. Kelly, Miss A. Hirtchey, Miss C. Carroll, Miss M. Davies, Miss Grace Holmes, Mrs. H. Hought, Mrs. F. Davies, Mrs. Geo. Briggs, Mrs. Percy Mansell, Mrs. Miller, Mrs. Kingswood, Mrs. Owston, Mrs. Williams, Mrs. Minnis, Mrs. Christie, Mrs. Webb, Mrs. K. Allison, Mrs. Spiers, Mrs. Paterson, Mrs. Robson, Miss H. Hayes, Mrs. Beaver, Mrs. Dunlop; Messrs. Smyth, Melhuish, Gentle, Passmore, Ruddick, Sheppard, Kemp, Warwick, Cooper, Fullerton, Kirtley, Benson, McQuillan, Costello, Swanson, Clare, Martin, Palmer, Simpson, Yeomans, Coulter, Morrison, Mansell, Cunningham, Boddington, Gurney, Sheppard, Mackinnon, Elder, Aggett, Wilson, A. W. Wilson, Dow, Clapperton, Miller, Sparling, Taylor, Quinn, F. S. Quinn, Fice, H. G. Morrison, Jas. Sherlock, Jno. Sherlock, Kingswood, Callow, Owston, Read, Mims, Williams, Pell, Rogers, Long, Webb, Macdonell, Webber, Clewes, A. Williams, Wright, Boddington, Case, Jury, Davies, Miles, Passmore, Howard, Birchard, Powers, Price, Goodman, W. Webb, Ayres, Christie, Thos. Webb, Keating, Schultz, J. Powers, H. Waterman, W. G. Foster, Chatham; Haight, Briggs, Howard Ackroyd, Ryding, Lawlor, Lepin, Maxwell, Paterson, Hemphill, Young, Meredith, Matthews, Ferguson, Seymour, Langley, Macdonell, Kelly, Cracknell, Lloyd, Cole, Fiddes, Higgins, Scott, Beaver, Spence, O'Brien, Alcock, Dunlop, Griffith, McMichael, Carter, W. Keating, Horkins, Lang, Allison.

The following members officiated in the various capacities which resulted in

all present spending a most enjoyable evening:

Chairman.—F. H. Gentle.

Secretary-treas.—T. B. Smyth.

Musical Director.—A. Melhuish.

Floor Manager.—Geo. Cooper.

Asst. Floor Manager.—Jno. E. Fullerton.

Chairman of Reception Committee.—Geo. Kirtley, who were ably assisted during the evening by F. Maxwell, Wm. Mansell, I. Wright, A. F. Passmore, Geo. Clapperton, T. Maxwell, N. Swanton.

Bodley's orchestra supplied the musical programme and a splendid supper was supplied by Preswick, the caterer.

LOCAL 264 SPEND ENJOYABLE EVENING.

The Saskatoon Labor Temple Co. will have to extend their large hall before Local 264 of the Plumbers and Steamfitters' Union hold their next annual whist, drive and dance. Gee, but it was a very nice crowd that extended the capacity of the above-mentioned premises to its utmost. It was certainly some cold outdoors and Jack Frost evidently had a smoke test on. That did not prevent Local 264 scoring once again, and though their first venture in this line, it was surely their greatest success, notwithstanding the lowness of the Ext. Temp. and the unusually (for this night. But if it was 40 below outside, it was very cosy inside and the large crowd fully enjoyed themselves.

The Bosses again showed their appreciation of the catering efforts of the local boys, by turning up in good numbers with their wives and friends.

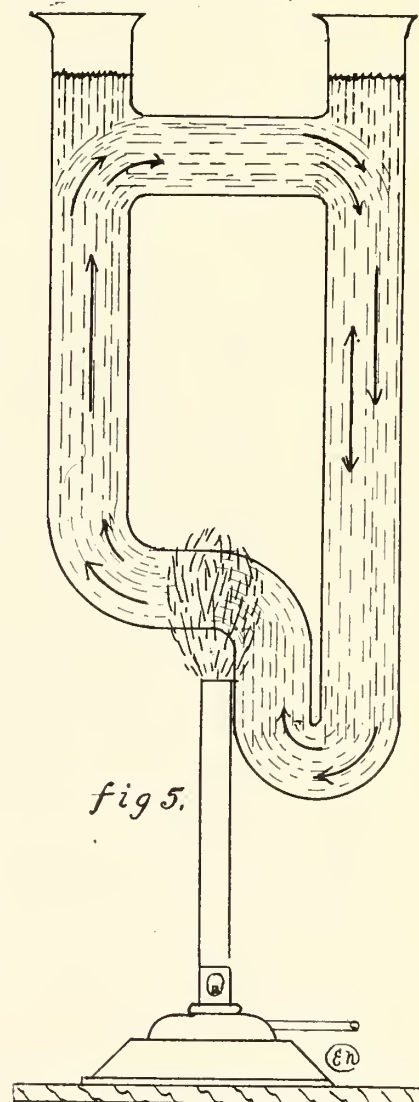
Amongst the ex-brothers present were noticed J. V. Brady, Jack Campbell and Geo. Taylor, the chief plumbing inspector. The latter fully justified the confidence the city fathers repose in him. Alike at work and play, he's always on the job. Not one of the plumbers could put it past him. He located all their faults and even turned down bricks from the ladies. He did not condemn the whole works, however, but said he "would look in again," and later turned in a "final certificate" for the smokes. presented to the most successful male tactician in progressive whist (by the Baldwin Hotel management). Mrs. Jack Curry, whose total points were but one less than Mr. Taylor's, won the splendid silver hand satchel (presented

by J. R. McMillan, Miss Perratt was consoled by a nicely beribboned and soothing musical instrument that quickly found its way into baby Curry's hands. Willie Smith secured the bag of marbles, whilst most of the crowd of over 150 circulated the Hall to the strains of Scott's Orchestra till far into the wee sma hours and all did justice to the excellent refreshments served soon after midnight. Alec Chesser, as one would expect from his wide experience, proved an urbane and efficient M.C., whilst Malcolm Nicolson presided over and marshalled the card players. Horace Nixon, as usual, was busy with his pencil, keeping tab of the proceedings for the local and trade papers.

DOMESTIC HOT WATER SUPPLY PROBLEMS.

(Continued from page 26.)

stone walls, all of which have to be considered in a different way. Thus we feel sure that all may in some way learn a few pointers from the experience of



others, though, as we stated in a previous instalment of this article, every job must be governed by general principles embodied in hot water heating.

The Ontario Society of Domestic Sanitary and Heating Engineers

A COMMUNICATION.

The following is a copy of Circular letter which we are sending out to all our members and the trade throughout Ontario, and we would ask that you publish this in your valued Organ:

“As the directors of this society are desirous of securing all the data possible regarding the sanitary regulations and conditions throughout the Province so as to demonstrate to the Provincial Medical Officer of Health, the necessity of a uniform Provincial Sanitary By-law; we ask that you will answer the following few questions and return same in the enclosed addressed envelope at once:—

- (1)—Have you a sewage system in your town?
 - (2)—Where does it discharge?
 - (Please name lake, river, or disposal plant.)
 - (3)—Have you a waterworks system?
 - (4)—If so, where is its source of supply?
 - (Please name lake, river, wells or springs.)
 - (5)—Are you working under a plumbing by-law or any regulations regarding the installing of plumbing or drainage systems?
 - (If so, please send copy of local by-law.)
 - (6)—Have you a system of plumbing inspection?
- Note:—Please sign your name in full, and town, as we need these for reference.

You will see from the above what the directors require to bring this matter before the proper authorities, and if we secure sufficient data we should not have much trouble in gaining our objects.

Another question that would seem to need the attention of our members is the proposed Workmen's Compensation Act, and I would suggest that each member should write to the Provincial Secretary, Parliament Buildings, Toronto, for a copy of the proposed Act, and become familiar with its contents. Of special interest to Sanitary and Heating Engineers, is Clause 36, Schedule 1, wherein they associate with plumbers, sanitary and heating engineers, the operators of passenger and freight elevators, theatre stage or moving picture employees. This would seem to be a needless added risk to be borne by the members engaged in our trades, and the directors propose waiting on the Government with a view to having our trades placed in a separate clause. There are other serious objections from our viewpoint, but is a matter that needs the attention of all the members.

Trusting you will give this the required publicity, I have much pleasure to remain,

Yours respectfully, G. F. FRANKLAND,

Cor.-Secy.

Problems in Sheet Metal Work

IN this issue we propose taking up a simple, yet practical, problem for the tinshop, viz:—that of developing the necessary patterns required for an ordinary measure. These problems are taken up chiefly with a view to keep our craftsmen in touch with the actual development of such articles from day to day, and also to assist those who, some day will be our future men, viz: the apprentices.

Not many years ago the writer was employed in a shop where quite a number of apprentices were employed. They were termed helpers, and oftener than not these lads were simply wasting their time, because most of the problems which were worked out happened to be too far advanced for the lads. They became indifferent and in many cases, after spending 3, 6 and even 12 months, they left the shop, took up a different line altogether, thus wasting so much time of

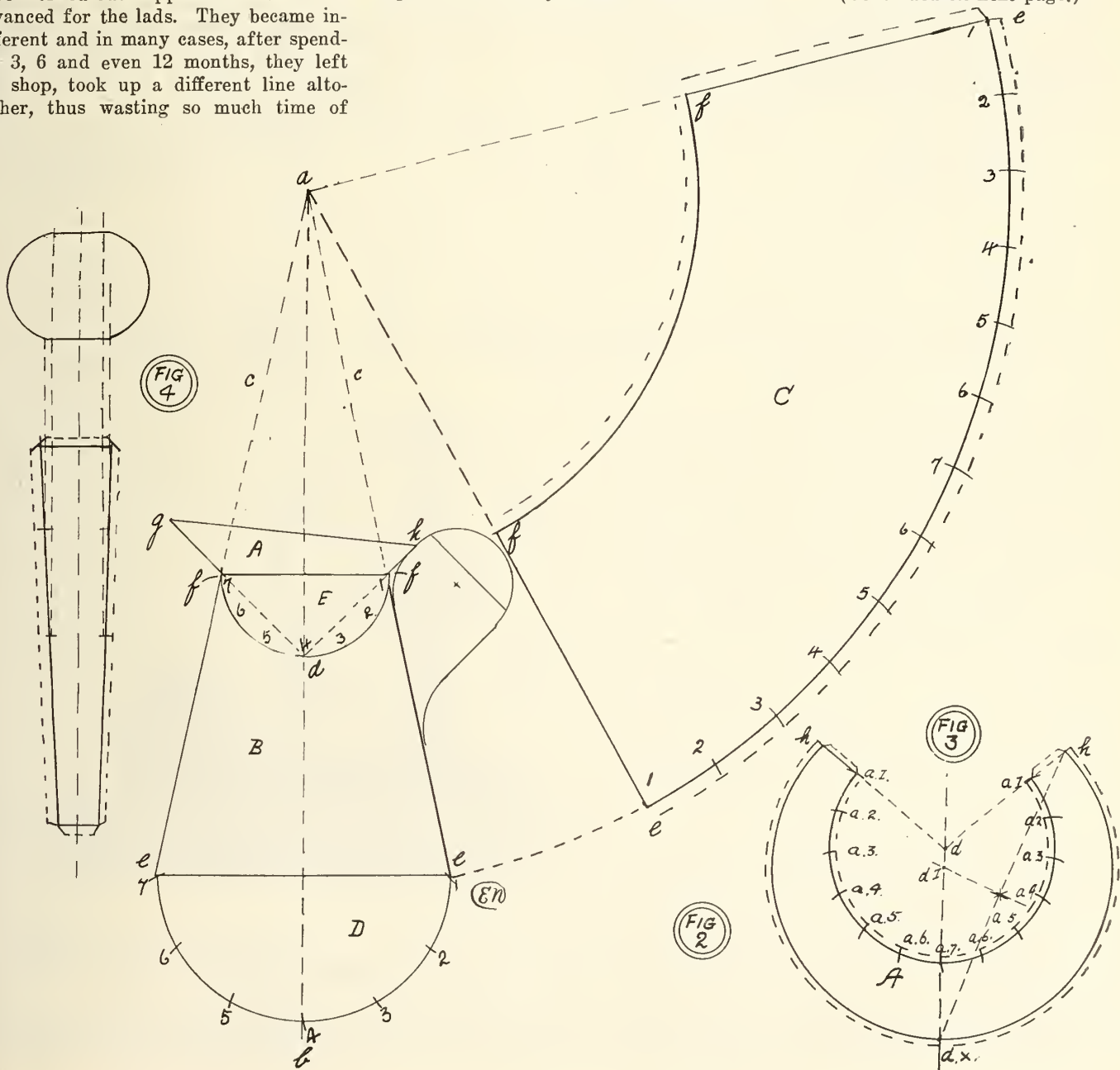
their lives. Those who stuck to their jobs often began doing work from mere habit as it were, just picking up a pattern, marking it off, then cutting and assembling. But if they had been asked to develop the pattern they were using, they could not have done so. These patterns we produce are simple, yet embody several of the principles which are required in most tinsmith work.

We will now take up the development of this measure. First turn to Fig. 2, and having decided the size, erect line *a b*; then draw the outline of measure in actual size, viz: flared lip *A*, body *B* and handle *X*. Then make arcs *D* and *E*. Next place the straight-edge in line with sloped sides of body from *e. f.* and draw

lines until they intersect perpendicular line *a. b.* making a centre; then place compass at *a* and open up to *C.*, developing arc *C*. Then measure off into 7 equal parts the arc *D* and stretch out these divisions on *e. e.*, starting at *e* with 1, 2, 3, 4, 5, 6, 7 and 6, 5, 4, 3, 2, 1. The dotted lines on the edge are simple to allow for seaming and must be determined or allowed for by those developing the pattern.

When *f. f.* has been drawn and lines drawn on this are from *f. e. f. e.* the pattern of the body is completed. For the bottom a circular piece is necessary twice the size of arc *D* with the necessary allowance for seaming.

(Continued on next page.)



Market Reports

MONTREAL.

There is, of course, a general lull in business at the present time but indications point to a very busy season in the present year. There is a general feeling that this spring will open up one of the best years in the building trade, as operations were curtailed to a great extent last year, and it is thought that those operations which were postponed last year will be started this year together with the usual yearly operations. In summing up the situation one of the local jobbers stated that 1914 looked to have all the earmarks of a great year for this trade. At the present time, though, it is very dull, although quite seasonable. There have been quite a number of repair jobs to keep the plumbing trade on the jump during the last few weeks, as the severe weather has had its usual effect on a good many buildings. Apart from that business might be termed seasonable.

Enamelware.—Of course this is the "off" season in this line and business is not expected to be very great but local dealers report an exceptional year in this line and trade seems to be keeping up remarkably well. It must be said though, that business has fallen off to some extent during the past few weeks.

Brass Goods.—Brass goods are receiving the usual seasonable attention although there has been a slight falling off in demand during the past few weeks. However, the repair demand is quite consistent and has shown rather an erratic tendency during the colder weather.

Black and Galvanized Pipe.—The demand is very quiet at the present time due to the season. There is not a great deal of business passing at present, although it is quite seasonable.

Pipe Fittings.—This market, of course, is much the same as pipe and does not show any more than a seasonable demand.

Soil Pipe and Fittings.—The demand of course, in this market is practically governed by the building trade which we all know is not any too bright at this time. It can be said, however, that business is quite seasonable.

Lead and Lead Pipe.—The demand has been quite heavy at times especially so during the cold spells when the extreme cold weather has played havoc with the fittings in many houses. At other times there is practically no demand in evidence with the exception of a very small trade.

Solder.—This market has shown rather a jaunty attitude as regards demand also

and as the weather would get colder the demand would get greater. However, taking it on the whole, business has been very good considering the season.

As to collections, there is a general feeling that these are improving since the first of the year. There is little doubt that the country is shaking off the pessimistic feeling which has been harbored by them for some time back and conditions are rapidly rounding into shape as a result.

TORONTO.

Toronto, February 14.—The general feeling of the trade is rather slow, though no quieter than is usual at this time of the year. The cold spell is resulting in a lot of repair work, which is appreciated by the smaller shops, who depend mostly on repairs, alterations, etc. The larger firms are getting some of their work under way as a result of the open mild weather previous to the cold snap, and quite a few of the larger jobs are now closed in.

It is reported that money is a little freer. Jobbers and manufacturers feel some improvement in collections, and in looking back, feel, that despite the tightness of money, which was felt during the latter part of 1913, business showed a fair average.

A big increase of business is expected this year, and factories are making preparations, so as to be able to make quick deliveries. A splendid spirit of optimism is felt throughout the trade.

Soil Pipe.

For several weeks during the latter part of last year, and the beginning of this, foundries were very quiet, but have recently begun to make up their usual daily tonnage, most of which is being stocked ready for prompt shipment. Prices remain unchanged and present demands are a little slow, though not quite as slow as usual at this time of the year.

Enamelware.

Jobbers report trade dull. The demand for this line, however, generally holds out longer than most lines, hence they are later in picking up. It is, of course, holding its own and nothing is to be complained of.

Lead Pipe.

There is a fairly good demand for lead pipe. Prices remain firm, and there is a tendency for a rise if indications do not change. One manufacturer stated recently, that in spite of the large quantity of galvanized iron pipe which is being used for water supplies, there seemed to be more lead pipe used than ever. They had not felt any falling off in the demand in the least.

Lead Traps.

Demands are fair considering the time of the year, there is a slight increase in the prices quoted. Discounts some time ago stood at 40 and 5 per cent off, but now there is only the 40 per cent. off the list.

Wrought Iron Pipe, Black and Galvanized.

Demands are slow, prices remain the same as quoted in December of 1913. Stocks are increasing at the mills and a heavy demand is expected earlier in the year than usual. No complaints, on the whole, are being heard.

Solder (Wiping) and Half-and-Half.

Fair demands, prices firm with a tendency to rise, tin is quoted half of a cent higher than last week, which also was an increase of half a cent on the week previous.

Brass Goods.

There are several changes being made in designs this year. They are heavier, and while demands are slow, a better class of goods are being asked for. High grade brass goods will be a blessing to the trade as a whole, as no doubt low-priced cheap goods are poor value at any price. This change should assist all concerned to raise the standard all around.



SHEET METAL WORKERS.

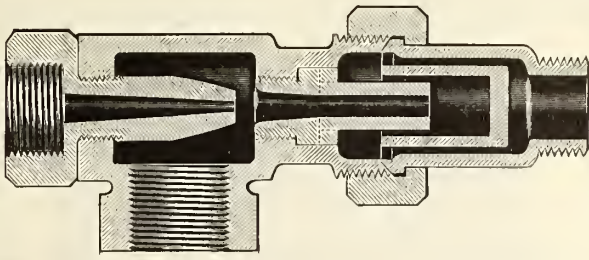
(Continued from page 29.)

We will now turn to Fig. 3, which is pattern of flared lip of measure A.

Place compass point at d in Fig. 2 and open up to f. Then transfer this to form arc which will be the inner shape of flare, having as centre d. From d drop a vertical line through centre of Fig. 2. Then beginning at a7, transfer spaces in Fig. 2 at arc f. d. f. to inner arc Fig. 3, as shown up to a1. From centre d draw lines through the intersections a1 a1, extending them as shown. The next step to take will be to develop the outer arc. First place compass at f in Fig. 2 and stretch open to g, being front of lip and place point at a. 7. d. in Fig. 3, repeating the same on back of lip, f. h., transferring this measurement to a1. on line intersecting. Then draw a line across from intersection h. to vertical line at d. Then divide this line equally and form right angle to intersect vertical line, thus making centre d1. From this centre open up compass to d.x., being form of lip and form arc on each side to h. h.

It is now only necessary to draw arc as seen by dotted lines to allow for laps and wire edge.

The handle pattern, Fig. 4, is so simple that it really needs no describing. It speaks for itself.



Morrison's

New Water Jet Lifter

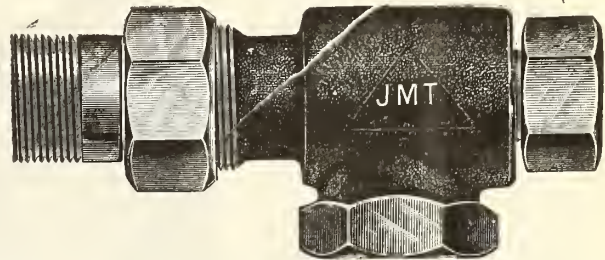
The Morrison Water Jet Lifter is a device for draining off any accumulation of water without the worry and expense of attendants and the old style of pump. This little ejector is designed to automatically pump water out of excavations, basements, etc., without any attention whatever except that necessary to attach it and set it in operation. It makes no difference whether the water is hot or cold, clear or muddy. There is nothing to adjust, nothing to get out of order, nothing to rust or corrode, nothing to clog up.

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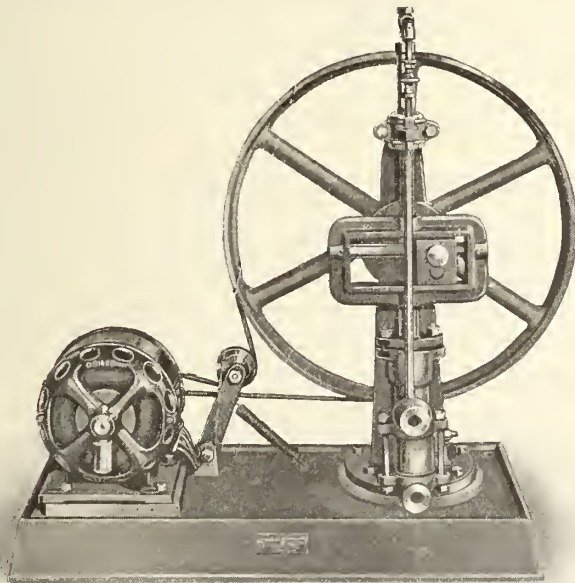
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Cut shows No. 1 Pump, 75-Gal. per hour capacity, at 100 R.P.M.

SPECIAL FEATURES.

Direct connected air compressor for pressure tank service.

Improved yoke—reducing noise to a minimum.

Outside packed plunger—prevents undetected leakage.

Rubber valves on brass seats. The removal of two nuts exposes both valves for inspection.

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A combination of **Simplicity, Efficiency and Durability** not equalled in any similar apparatus.

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BLOCK TIN PIPE

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Head Office
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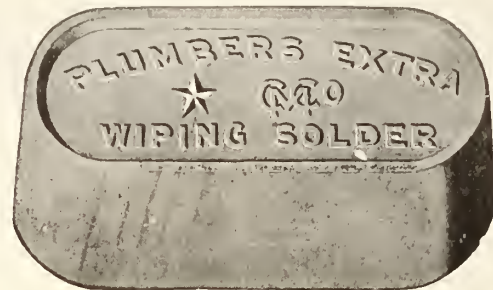
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The index is inserted solely for the convenience of the readers of the paper.

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A practical treatise on working sheet copper into all forms. By John Fuller, Sr. 327 pages; 474 engravings; size 10 x 6½ inches. Cloth bound. Price \$3.00.

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By William Neubecker, Instructor, Sheet Metal Department of N. Y. Trade School. 288 pp., 370 illus. Half Morocco binding. A complete manual of practical self-instruction in the art of pattern drafting for light and heavy-gauge metal, skylight work and roofing, cornice work, etc. Price, \$3.00.

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For tin, sheet iron and copper plate workers. By LeRoy J. Blinn. 296 pages; 170 figures. Size 5 x 7½ inches. Price \$2.50.

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It will be the best issue of the whole year, both from an editorial and advertising standpoint. It will contain the largest and most varied number of advertisements that Sanitary Engineer has ever presented to the trade. Its advertising pages will be fairly representative of the manufacturing and jobbing concerns in Canada and the United States, who handle reliable and thoroughly up-to-date Sanitary and Heating Engineering Supplies.

By advertising impressively in this number, firms will show the trade that they believe in their goods, and are willing to stand behind them—that they fearlessly place them before your attention, in competition with all comers.

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Watch for this Spring Number

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There is a new way to thaw frozen pipes. Live, up-to-date plumbers who know that time saved means money earned and greater profits are using

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Note these actual test figures.

Plumber—Ordinary method for cleaning frozen pipes, 2 to 3 hours, charge.....\$4.00
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Time saved—1½ to 2½ hours

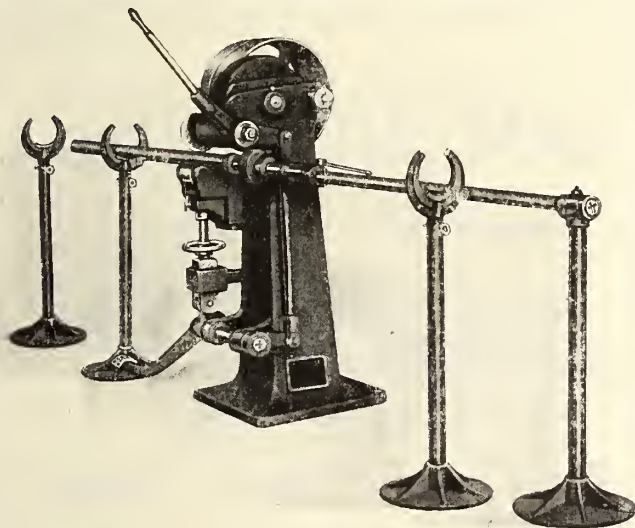
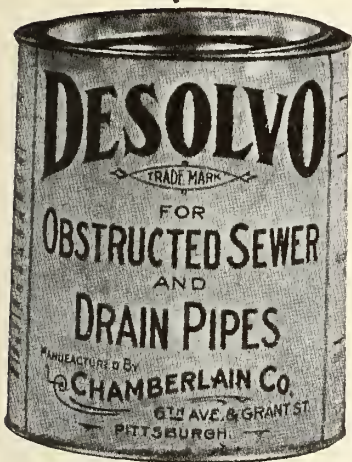
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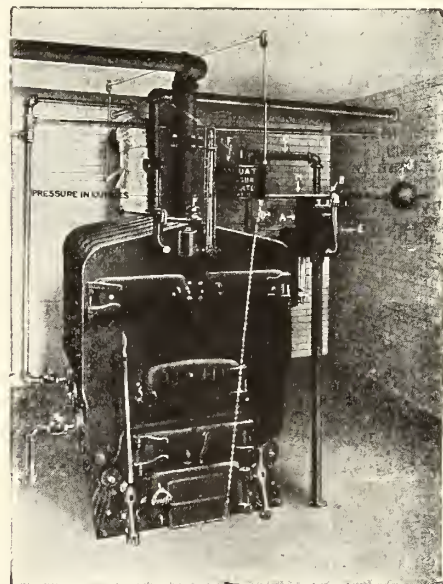
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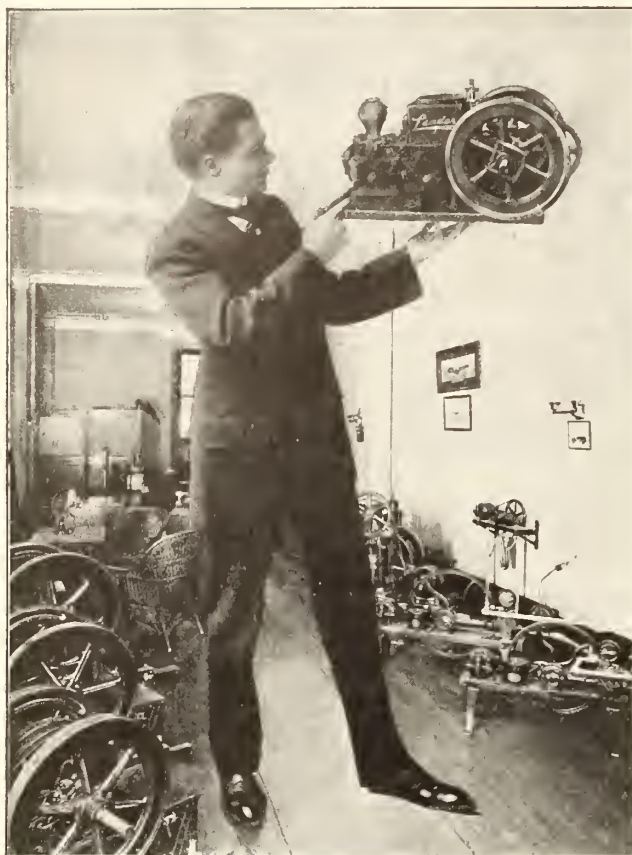


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Leader Iron Works NEW YORK
Inter-Office Correspondence

To Decatur. Date Jan. 17, 1914.
Subject: Fig. 300 Pumper.

Attention of Mr. O'Brien.

Answering yours of the 15th inst., inquiring of the general impression Fig. 300 Gasoline Pumper has made on visitors to the office

Would say in my ten years' experience in selling pumping machinery I find less salesmanship is required to sell Fig. 300, and more pleased customers after it has been sold, than with any piece of machinery which I have handled.

I do not think of any improvement other than to make more pumps, for, as you know, we were short all last season.

Yours truly,

LEADER IRON WORKS,

Per S. A. BROWN,
Resident Manager.

SAB-M

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Leader Iron Works DECATUR
Inter-Office Correspondence

To New York. Date Jan. 19th, 1914.
Subject: Fig. 300 Pumper.

Attention of Mr. S. A. Brown.

Replying to your letter of January 17th.

We believe we have anticipated the coming demand for Fig. 300 Pumps in arranging to take care of three times last year's sales, and you may inform those who call at the office accordingly.

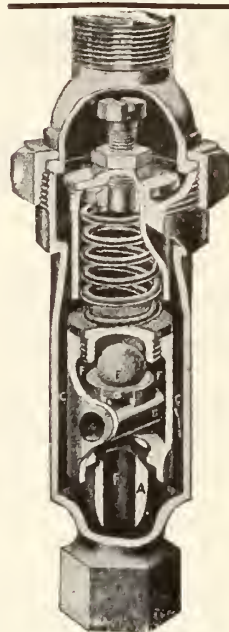
We are glad to note your trade is pleased with the design and operation of this rig, and believe this information will be of interest to the trade generally.

Yours truly,

LEADER IRON WORKS,

By T. E. O'BRIEN,
V. P. & Mgr.

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It cannot move further and this compression would not weaken it in a hundred years—who of us will be alive at the end of that time?

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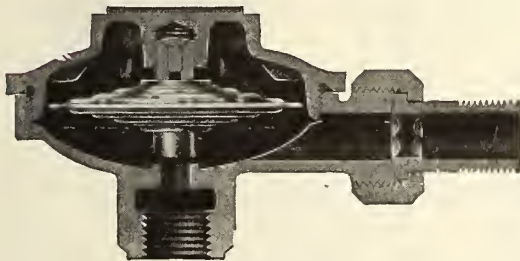
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A radiator trap that does not have to be especially adjusted or fitted for each particular condition, but one that you know will work under all conditions and last throughout the life-time of the installation. A trap that will help to cultivate profitable customers for you.

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Performs the functions of a Radiator Steam Trap perfectly and continuously. Eliminates water and air without loss of steam.

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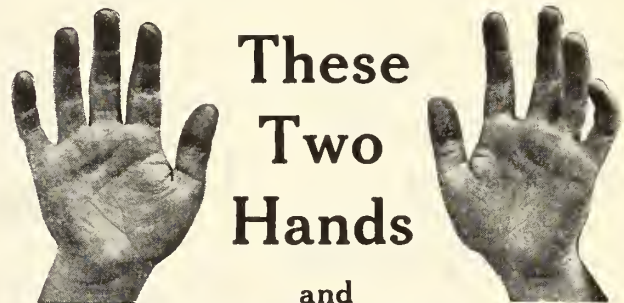
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FIRST-CLASS PLUMBING AND PUMP business in a town about 2,000, doing a good trade, water works just installed last summer and a good business is being done. An A1 business for a first-class plumber, stock about \$800.00. Good reasons for selling. Address Box 73, Fergus, Ont. (4tf)

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to make use of this paper. Any article or problem of interest, any topic of note will be used if any such has a tendency to uplift the Trade.

Every local or provincial association can use this paper free of charge to make other members acquainted with the business done and benefits derived from being an organized body.

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One of the most successful retailers of late years says: "When a firm advertises in trade papers it is getting into good company. As I pick up one of a dozen of these periodicals here in my office, and glance through it, I find that the best people, the successful firms, are represented in such a way as to reflect their importance in the trade."

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FOR
SEPTIC TANKS

WATSON AND PAUL
93 St. Genevieve Street, Montreal



**GENUINE
ARMSTRONG STOCKS
and DIES**

FOR THREADING PIPE OR BOLTS

KNOWN, USED,
COMMENDED EVERYWHERE

PIPE MACHINES,

both Hand or Power

HINGED PIPE VISES

PIPE CUTTERS

PIPE WRENCHES

RATCHET ATTACHMENTS

**BARD ADJUSTABLE
BUSHINGS**

Manufactured by

**THE ARMSTRONG M'F'G.
CO.**

317 Knowlton St.

BRIDGEPORT, CONN., U.S.A.
NEW YORK CHICAGO

WRITE FOR CATALOG

Only One

kind is necessary for your various jobs—fittings or pipe. You can save the cost and the carrying about of more than one tool.



Williams' "AGRIPPA" Chain Wrenches are recommended unconditionally.

Williams' "AGRIPPA" Chain Wrenches do not depend upon only one point of contact for a bite—long life of wear assured.

Williams' "AGRIPPA" Chain Wrenches never place any compounded strain upon the chain—continuous operation assured.

Williams' "AGRIPPA" Chain Wrenches bear every mechanical feature necessary to complete utility and service — operating efficiency guaranteed.

YOUR DEALER WILL SERVE YOU.

J.H. Williams & Co.

Superior Drop-forged Tools

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40 So. Clinton St., Chicago, Ill.



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Because of its especially attractive design, its easiness of operation and the perfect service it gives.

It is rapid-acting compression work—an excellent combination of all the best features of Fuller and Compression work.

It wont open under pressure, is adjustable to any desired flow and is a strictly high-grade article.

Rapidac is backed by the Mueller Unconditional Guarantee.

Send the coupon to-day for full information.

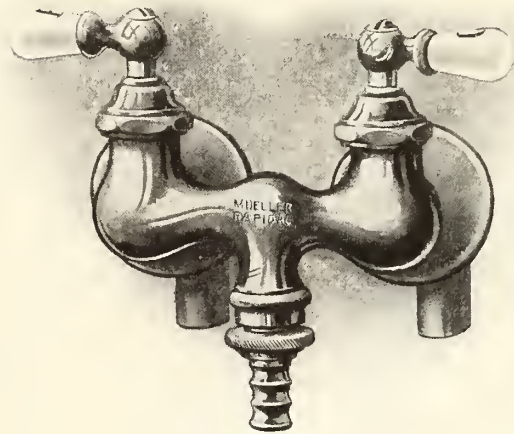
Made in Canada.

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New York

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9442

H. Mueller Mfg. Co.
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Signed.....

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Province.....

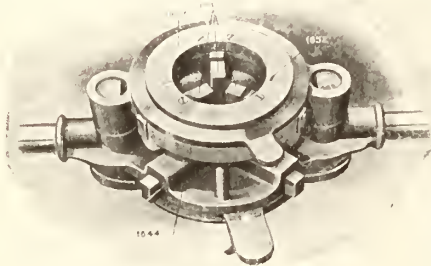
"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

Exert your energy where it can do most good.

Conserve it for figuring out how to better accomplish the job, for pushing ahead, for becoming a leader in this race we call "Life." Save some of it to enjoy yourself with after a strenuous day—you're entitled to your share of recreation and it's as necessary as is hard work, to your success.

But do **not** waste good energy, slaving and pulling at one of those old-fashioned wide-died stocks. Get a

Premier Die Stock



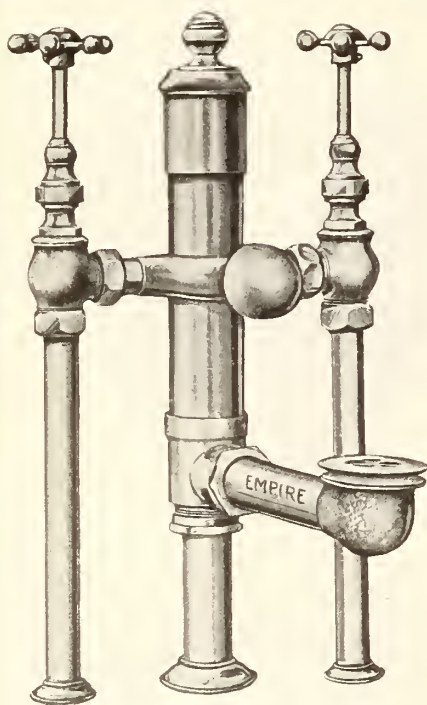
with narrow receding dies, that start at full depth of thread and **back** themselves off in conformity with the tapered thread.

No chance of wasted energy here, because the Premier takes just enough power to cut the thread only. It has no loose parts to get lost and its completely automatic movements are accomplished without lead screw or nut.

No. 1 cuts $\frac{1}{2}$ in. to $1\frac{1}{4}$ in. right, left-hand dies extra. No. 2 cuts 1 in. to 2 in., right or left hand, with the same dies.

Let your dealer demonstrate it.

BORDEN-CANADIAN COMPANY, Toronto, Ontario



Sitz Bath Set of Bell Supplies and Waste

The Figuring of time is always the Sticker on any job

On any large contracts there is always an allowance made for unforeseen troubles over and above the possible minimum time.

If you want to minimize this item and add it to your profits use

EMPIRE PLUMBING GOODS

All our fittings are made to standards and thoroughly tested and inspected before leaving the factory and are guaranteed to fit exactly the fixtures they are intended for.

If you have not used them, specify them in your next order, if you have, we know you will continue to use them.

Empire Mfg. Co., Ltd.

Head Office and Factory, LONDON, Ont.

Montreal Office, Room 31, C. P. R. Telegraph Bldg.
Winnipeg Office, 109 Carlton Block, Portage Ave.

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THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER



The Pipe Couplings that are trouble-proof

Both Sections are seated with Non-Corroding BRONZE, machined and ground to a true BALL Joint.

Can be connected time after time without impairing their efficiency. Are never affected by expansion, contraction, vibration or corrosion.

Manufactured by DART UNION CO., Limited, Toronto

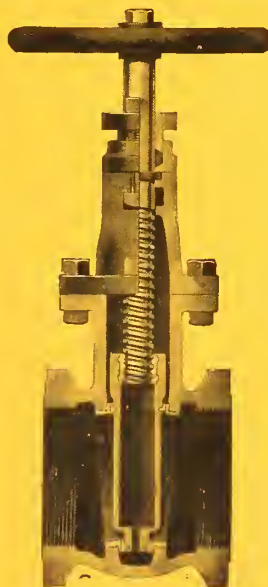
Jobbers from coast to coast sell them.

K E R R

(New "KEYSTONE" Pattern) GATE VALVES



If you have not used any of these New Pattern Valves, specify "KERR" in your next order. We want you to get acquainted with the most reliable valve on the market.



If you have been using them, we are confident that your satisfaction will bring us your repeat orders. These valves will never cause you or your customer the slightest trouble. Their high quality is consistent.



When you buy a "KERR" Valve you get a guaranteed article that is backed by a reliable firm. Many of the largest distributors of valves in Canada have sold "KERR" Valves for over 25 years, and are still recommending them as the "Best Valve."

Write us for particulars.

Kerr Engine Co., Ltd.,

Valve Specialists

Walkerville, Ont.

TRADE MARK
GALT BRASS

Overflow Tube
Telescopes

Waste Tube
Telescopes



No Time Lost
Connecting

THE

"ADJUSTO"

Cast Brass Strainer

Cast Brass Waste Plug

Cast Brass
Coupling Nuts

Manufactured
only by

GALT BRASS CO., Limited, GALT, CANADA

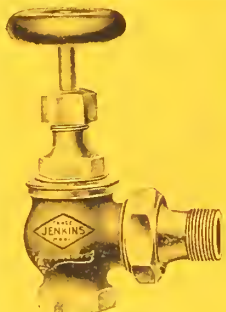


Fig. 168.



Fig. 169.



Fig. 175.

JENKINS BROS.

RADIATOR



VALVES

Perfect Radiator Service

Depends Wholly Upon the Valve.

No matter how perfect the system, a leaking valve makes regulation of temperature impossible. With the JENKINS BROS.' VALVES, perfect contact and consequent tightness is ensured by the use of the JENKINS DISC, which eliminates leakage through a valve due to improper contact between the seat and the clapper. JENKINS BROS.' radiator valves have heavy bodies—substantial trimmings and are made of a fine grade of steam metal. The workmanship throughout is of the best.

Made in various styles—fitted with either wood, brass or iron wheels, also with lock-shields.

Write for further particulars.

JENKINS BROS., LIMITED

103 St. Remi St.

MONTREAL



Fig. 181.



Fig. 167.



Fig. 174.

THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

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TORONTO, 143-149 University Ave.
CHICAGO, 140 S. Dearborn St.

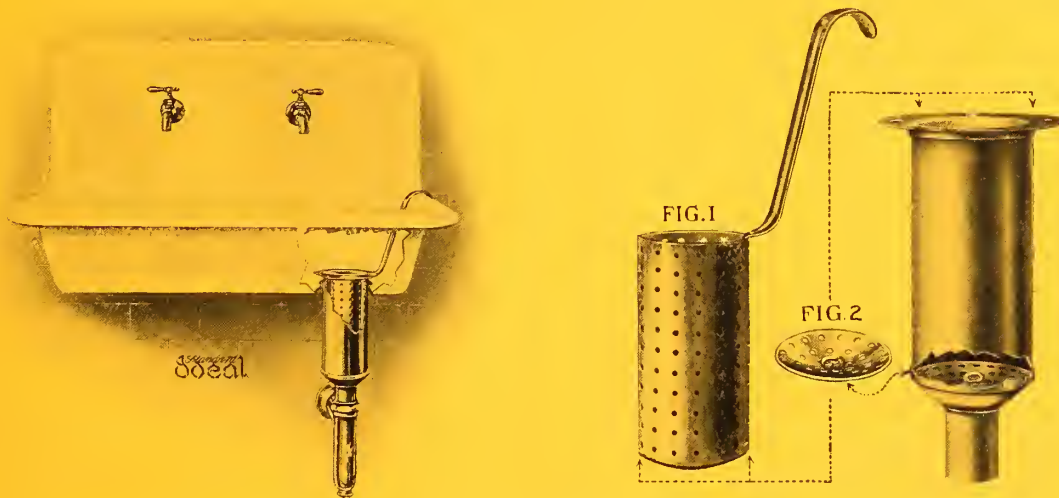
WINNIPEG, 34 Royal Bank Building
NEW YORK, 115 Broadway

Vol. VIII.

Publication Office : TORONTO, MARCH 2, 1914

No. 5

Standard **SANISTRAINER** -PATENTED-



F-321—18x30 Roll Rim Sink supported on Concealed Hangers, and with Sanistrainer.

LIST PRICE \$14.50

Fuller Bibbs and 1½-inch P Trap as shown, \$5.75 extra. **Additional Patterns in preparation.** The Sanistrainer represents the most notable advance made in the improvement of Sink Strainers during recent years, and meets the demand for a Strainer that not only strains but also **COLLECTS THE REFUSE OF THE SINK** in such a manner that it can be conveniently removed, without coming in contact with the hands.

The combined **Refuse Collector and Strainer** (Fig. 1) may be conveniently lifted from the Sink for emptying and cleaning, and the liability of the Drain becoming clogged while the Strainer is removed is eliminated by a secondary Strainer Plate, as shown in Illustration (Fig. 2).

The Sanitary and Convenient Features of the Sanistrainer should appeal instantly to any Housewife, and if these are displayed in your Show Room, they should become ready and extensive sellers.

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

TORONTO
119 King St. East

MONTREAL
42-44 Beaver Hall Hill

WINNIPEG
76-82 Lombard St.

VANCOUVER
410 Carter Cotton Bldg.

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

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178 Victoria St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes,
120 Lombard St., Winnipeg

BRITISH COLUMBIA:
A. O. Campbell,
864 Cambie St., Vancouver



GENERAL OFFICES AND WORKS:

FITTINGS LIMITED, OSHAWA, CANADA

WAREHOUSES:

MONTREAL

WINNIPEG

VANCOUVER

CATALOG FURNISHED UPON REQUEST

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

"Standard Sanitary" Plumbing Fixtures



"Standard Sanitary" Bathroom of Queen Victoria of Spain.

The above cut was made from a photograph of the fixtures actually installed in the Royal Palace of La Magdalena, Santander, Spain, the summer residence of their Majesties, the King and Queen of Spain.

A similar bathroom was also installed for the King, and eighteen other complete "Standard Sanitary" Bathrooms for the other members of the household.

This is an extremely practical and beautiful interior and combines with beauty and refinement every modern sanitary idea.

The fixtures are set into the tiling, thus offering no place for dust or moisture to collect, and reducing cleaning labor to a minimum.

The Foot, Sitz and Shower Baths make an unusually complete and artistic bathroom at a cost that is very reasonable, considering the quality of fixtures shown.

"Standard Sanitary" plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales-agents throughout the Dominion.

Standard Sanitary Mfg. Co., Limited

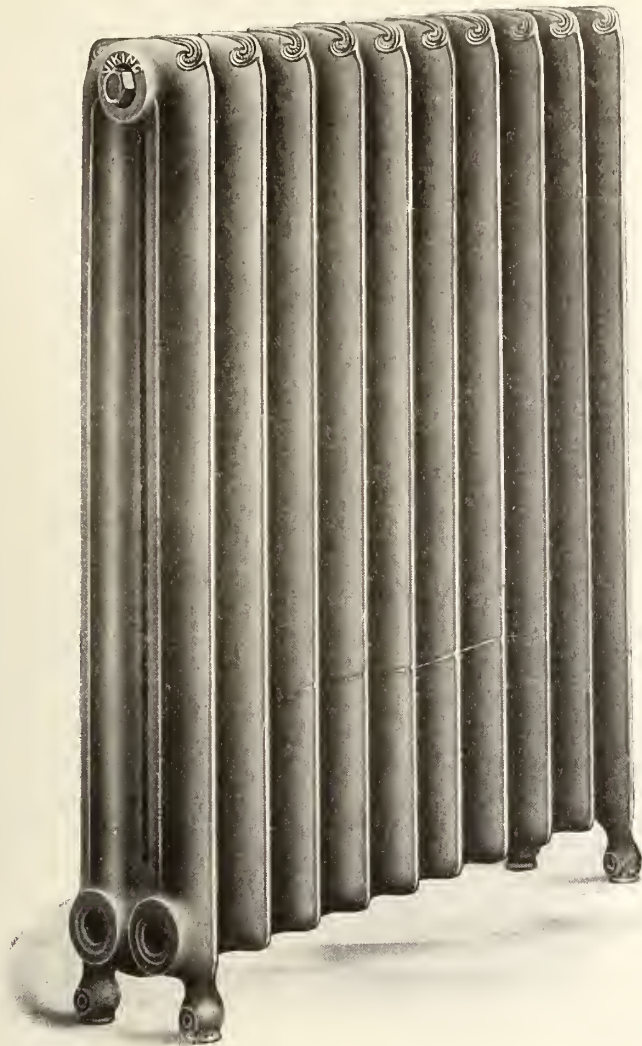
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55-59 Richmond Street East.

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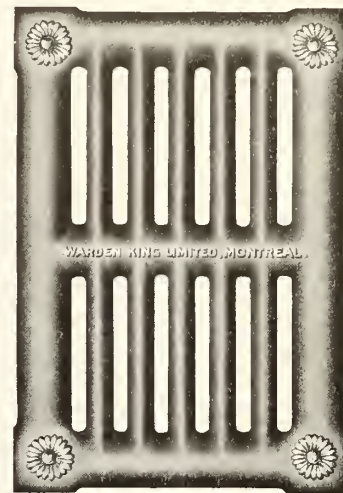


Just Out!

The New

“VIKING”

RADIATORS



These are the latest additions to our products, and are the neatest Radiators on the market to-day. They are fully described in our new Catalogue. Send for a copy at once.

We are the sole manufacturers of the celebrated “Daisy” Hot Water Boiler. Over 50,000 in use. This speaks for itself, and repair parts, if necessary, for any of the different styles, may be obtained at once.

WARDEN KING LIMITED, MONTREAL

Branch, 200 Adelaide St. West, TORONTO

AGENTS
IN
CANADA

The CRANE & ORDWAY CO., WINNIPEG, MAN.
The MECHANICS' SUPPLY CO., Limited, QUEBEC, QUE.
The JAMES ROBERTSON CO., Limited, ST. JOHN, N.B.
The WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

“When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.”

Coming—the biggest issue of Sanitary Engineer yet published

On April 1st, we will place in the hands of the trade, the biggest and best edition of Sanitary Engineer ever published. This number will be the first of what we intend to make a regular feature—the Annual Spring Number.

It will be the best issue of the whole year, both from an editorial and advertising standpoint. It will contain the largest and most varied number of advertisements that Sanitary Engineer has ever presented to the trade. Its advertising pages will be fairly representative of the manufacturing and jobbing concerns in Canada and the United States, who handle reliable and thoroughly up-to-date Sanitary and Heating Engineering Supplies.

By advertising impressively in this number, firms will show the trade that they believe in their goods, and are willing to stand behind them—that they fearlessly place them before your attention, in competition with all comers.

The “news” pages will be full of good, live reading matter, fresh from the pens of some of Canada’s best writers who have specialized on problems of sanitation, heating and ventilating. See list of articles elsewhere in this paper.

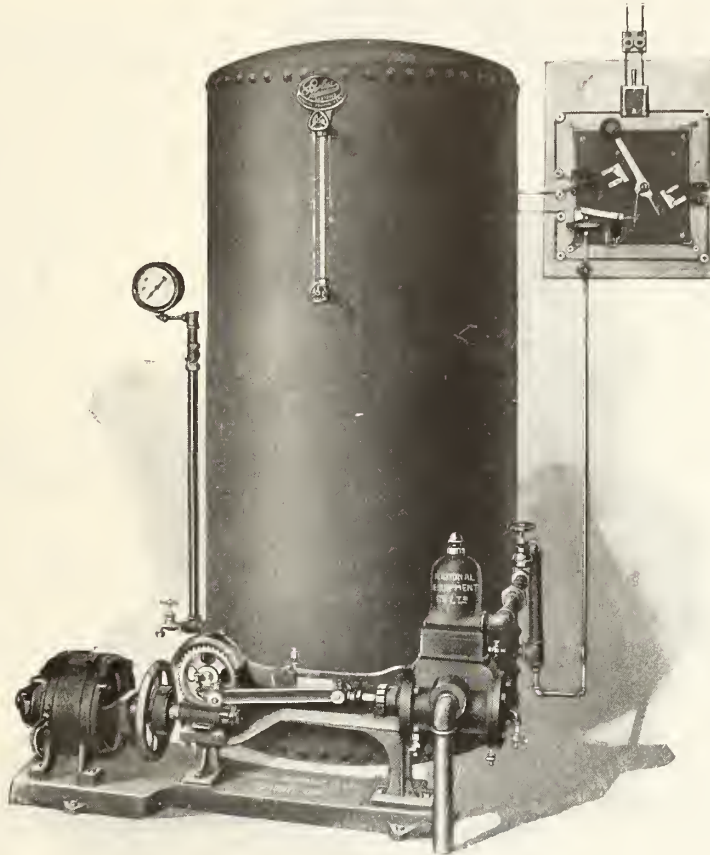
Watch for this Spring Number



Every satisfied User
tells his Neighbor



*A
Peerless
System
Backed by*



*A
Peerless
Canadian
Reputation*

(Peerless 400 Series)
Silent Electric House Pump

Will supply 400 gallons of water per hour. One hour pumping will supply 40 gallons of water per day for a family of ten persons—half that amount is usually sufficient.

Has Peerless special combination air intake, and automatic motor controlling switch.

Motor direct connected to pump by means of accurately cut and well-balanced worm-gear drive. No belts to wear—no lost motion

All of the four solid rubber disc valves can be exposed by unscrewing one nut.

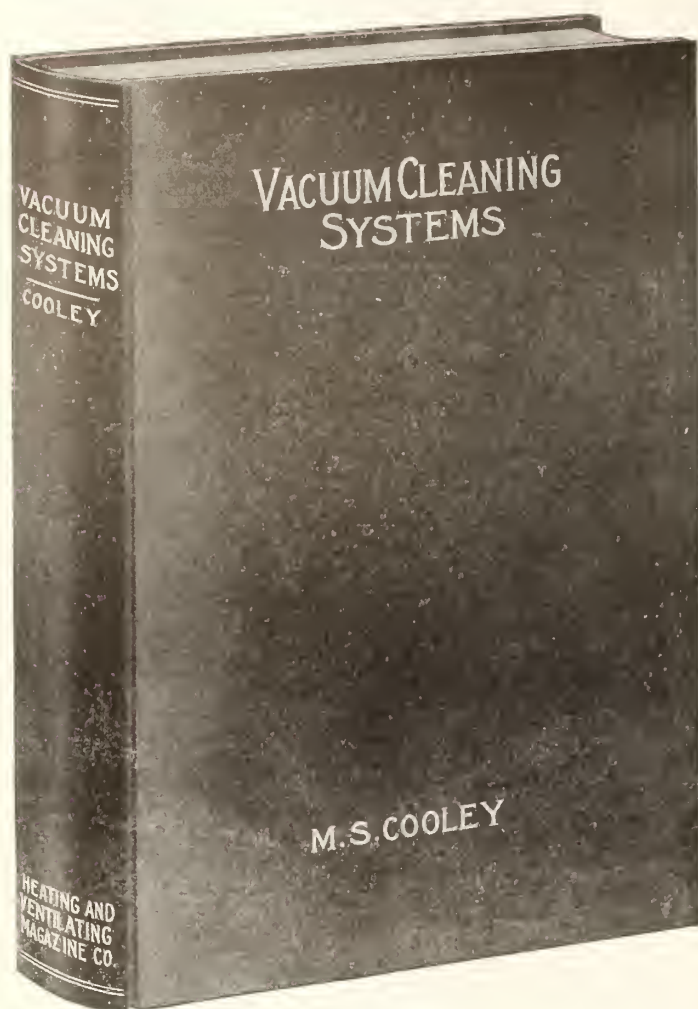
Our water service systems are just as their name implies, "PEERLESS." How can you afford to handle a foreign make when we offer you one that has a home record of efficient service—one that is backed with a guarantee by a firm located at your very door—one that's exceedingly easy to instal?

It will be to your interest to get full particulars. Drop us your request to-day.

National Equipment Company, Limited
Wabash Ave. Toronto, Ont.

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Have you got your copy yet?



Vacuum Cleaning Systems

By M. S. COOLEY

Mechanical Engineer,
Office of Supervising
Architect, Treasury
Department, Washing-
ton, D.C.

*244 pages, 6 x 9 inches.
105 Illustrations. 20 Tables.*

PRICE, POSTPAID, \$3.15

The first full and authoritative treatise on the art of vacuum cleaning. Contains all of the author's important tests of vacuum cleaning apparatus, history of mechanical cleaning, requirements of an ideal vacuum cleaning system, together with chapters on the carpet renovator, other renovators, stems and handles, hose, pipe and fittings, separators, vacuum producers, control, scrubbing systems, selection of cleaning plant, tests, specification and portable vacuum cleaners.

A Book for Engineers, Architects, Superintendents of Buildings, Sanitary, Heating and Ventilating Engineers and Others Interested in the Correct Design and Installation of Mechanical Cleaning Plants of Any Type.

TECHNICAL BOOK DEPT.

MACLEAN PUBLISHING CO.

143 UNIVERSITY AVE., TORONTO

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Nye the Die Man

I wouldn't have had the nerve To go into this business of making PIPE THREADING DIES

except for one,—just one reason.

I know—sure as shooting that there isn't a pipe threading die on earth—I don't care what make it is—that will do what the NYE DIE will do for you men who USE dies for pipe threading.

The NYE is as different from other dies as toadstools are from real mushrooms—It saves 50% in pipe threading time, labor and expense—and to prove it—TRY IT 10 DAYS FREE—MY RISK.

AM I fair? Try me out? You'll swear by me and my die if you do—Write to-day—Now!



The Nye Tool and Machine Works

124 N. Jefferson St.,

Chicago, Ill.

TWO CENTS PER WORD

You can talk across the continent for two cents
per word with a Want Ad. in this paper.

PEASE IDEAL STEAM BOILERS

Write to-day for Catalogue and Prices.

Pease Foundry Company —LIMITED—

Works: Brampton. Head Office: Toronto.
Branches: Vancouver, Winnipeg, Hamilton,
Montreal.

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal

Works: Lachine Canal

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SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, MARCH 2, 1914

No. 5

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Over
150,000
In Use



*Watch these
figures rise*

This tank is in big demand because it ensures satisfied customers.

There are no joints to open up, no linings to leak and when installed will outlast that of any other closet tank made.

All fittings are made from the best quality ingot metal, which is insurance against sand holes and other imperfections.

Every VITRO Tank is tested under working water conditions before leaving the factory.

VITRO

NO TROUBLE TANK

Handsome
in Finish

Beautiful
in Design

Unconditionally Guaranteed



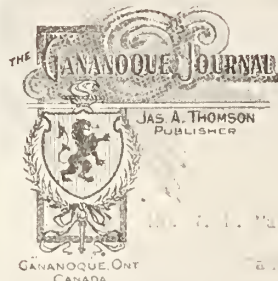
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Office and Factory: 65-75 Sterling Road, Toronto, Ontario

SOLD BY ALL JOBBERS

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STEEL AND RADIATION, LIMITED



July 15th, 1914

Mr. J. A. Thomson,

Editor, The Canadian Journal,

Dear Sir,

I have a "KING" boiler which you installed in my new residence and am most extremely satisfied, but the real test came when the cold spell on Tuesday and Wednesday of this week. I allowed my house to cool down to the first morning, and then turned on the heat (with a temperature outside of over twenty below) and found it most comfortable and efficient. The temperature inside at seventy. This, however, was with the boiler having only been running a few minutes. I put on a second coil, let the gas burn off for a few minutes, and on returning home in the evening it was comfortable, but considerably colder outside. I kept the boiler on until it was coal, and I find it is easily the best and a more satisfactory heat. I am most grateful to you for the installation and the best of satisfaction to all those.

Yours very respectfully,

Jas. A. Thomson
Publisher, "The Canadian Journal."

We are reproducing here one of the many unsolicited expressions of satisfaction received recently from **all parts of Canada**, and which only emphasize the fact that **"KING"** Boilers are, as claimed, just a lap or two on every point in advance of every competitor.

"KING" Boilers have long since passed the experimental stage, and our Competitors have been compelled to think up (some **new** arguments).

Thousands are now in use and giving results, such as shown by the reproduced testimonial herewith.

"KING" Boilers will satisfy your clients, and satisfied customers are the best advertisement.

We guarantee to deliver **promptly** from stock, Boilers and Radiators, also Steamfitters' and Engineers' Supplies.

Get our "New Fitters' Hand-Book." Full of Heating knowledge.

STEEL AND RADIATION, LIMITED

HEAD OFFICE, Fraser Ave., TORONTO

Branches:

138 Craig Street West, MONTREAL
101 St. John Street, QUEBEC

Showrooms:

80 Adelaide Street East,
TORONTO

Agencies in all the leading Cities in Canada

THE SANITARY ENGINEER

VOL. VIII.

MARCH 2, 1914.

No. 5

Should Sanitary Engineering be Under the Jurisdiction of the Architect's Department?

Sanitary Engineer Says No, and in This Article Will Show Reasons Why Health Department Should be the Head.

SOME time ago a discussion took place in a Canadian city, dealing with the matter as to which civic department the plumbing inspection should be governed by, and one alderman advocated that it should be under the jurisdiction of the building inspector. Now according to an article which appeared in a recent issue of a Toronto daily paper, we find the Toronto city fathers purpose placing the plumbing inspection under the jurisdiction of the architect's department.

Not Good Policy.

We will endeavor to show that a grave mistake will be made if such a course be taken.

Those who are engaged in the business of sanitary engineering, are only too well aware what might happen. They know from practical experience that sanitary engineers and architects are anything but a good mixture. There is no connection between the two. The architect has quite enough to attend to if he does his work properly, without burdening himself with a department he knows little about. Any connection which he may have may be governed by by-laws, such as ventilation, and even then this matter is one for the board of health. If, however, a recommendation had to be considered which would place the architect's department under the jurisdiction of the Board of Health it would be a move in the right direction. The architect draws plans of a building, he places windows here or there, so as to look well, mostly to please his client. He very seldom puts in a word for good ventilation, or we should not now have so many poor unsanitary buildings in our towns and cities as we have at present and we should not have such poor provision made for the carrying away of our house sewage.

Architects have up to the present been the head authority in these matters as far as specifying the material, fixtures, etc. They have held sway up to now with what results? The sanitary and heating engineer has to send in scores of tenders, all based on vague specifications, which are neither just to the owner or the tenderer,

The writer can cite two cases where specifications have been made for plumbing, which was not in accordance with the plumbing by-laws, and which if installed would have cost the owner a lot of money. Then further, at the conclusion of most plumbing specifications, a clause is inserted pointing out, that in case of any error on the part of the architect's specifications the plumbing contractor must put things right at no extra cost.

The fact of the matter is, the architect has enough to do to attend to his own work, without taking upon himself a burden he is not able to carry. The same argument applies in the civic architects departments all over the Dominion. The present investigation which is being carried on in connection with the Toronto city architect's department, is surely enough argument to prove that that department is scarcely competent to look after its own affairs, without our city fathers putting another burden upon them. What is more, the plumbing division is becoming large enough to warrant a separate department. Here are a few reasons why the plumbing should not be attached to the architect's department. First, an architect could not be expected to understand every point of a plan of sanitary engineering, because there are so many conditions to be taken into consideration which would require actual practical knowledge, before a proper decision could be arrived at, and, such decisions can only be arrived at, by men who have made sanitary engineering their study, and who have actually installed such engineering work. Second, the plumbing department has not only to keep an eye over the new work which is being installed, but has also to inspect old work and installations which have become unsanitary. For instance, the health department traces some cases of illness. They send an inspector of sanitary engineering and he passes judgment on the sanitary engineering, stating to what extent it is, or is not defective, and after seeing that defects, if any, are rectified, he reports to the health depart-

ment that all is now OK, and there the matter ends.

But in the event of the architect's department taking over the jurisdiction of the plumbing. Then, in case the health department finds the plumbing in not too good a state, its official must report to the architect's office and the head of that department will then have to consult another official under him, who, of course will be a plumbing inspector. This latter official will require to report to the health officer, so it can easily be seen that such a round-about way would not only prove to be inconvenient, but also would lack efficiency. The plumbing department is nothing more or less than the engineering part of the health department and should by all means be amalgamated with that department, if with any.

Further, as we stated before, the plumbing, or sanitary engineering, which is required even in a single residence is becoming more than ordinary work, it is becoming more complicated, and requires more than ordinary skill to install. The public are beginning to value the work of sanitary engineers more than ever, they are finding that first-class plumbing is the cheapest in the end, they are demanding more efficiency than ever from the craft, and it cannot be expected that an architect should be able to keep strides and be a professional in his own line, as well as in those lines involved in the every-day accomplishments of the sanitary engineer.

Heating and Ventilation Should be Added to the Health Department.

Another thing, to remember is, that, if the architect's department were burdened with the sanitary engineering, they would in the near future be required to look after the heating and ventilation. These two classes of engineering are so vital, although they have not been under any jurisdiction as yet, and will no doubt require to be looked into.

(Continued on next page.)

Appointment of Western Canada Editor

Chas. W. Byers to be Western Canada Editor of Sanitary Engineer—Rapid Growth of the West Necessitates an Addition to Staff of Western Representatives.

THE growth of the Western Canadian provinces has been so rapid, and of such importance, that Sanitary Engineer has recognized the necessity of making additions to the western staff. In addition to the present Vancouver and Winnipeg representatives, Sanitary Engineer will, from now on, have a Western Canada editor, in the person of Chas. W. Byers, with headquarters in Winnipeg.

Mr. Byers will tour the West in the interest of Sanitary Engineer and will keep closely in touch with the western trade, studying trade, and market conditions, and problems which confront the western sanitary engineer.

The appointment of a Western Canada editor will help to strengthen Sanitary Engineer where it is already strong and will demonstrate to our many readers in the West, that Sanitary Engineer is not slow to recognize any improved service which can be instituted for the benefit of the readers of this paper.

Chas. W. Byers the western editor of Sanitary Engineer is well qualified for the position, as he has had a thorough newspaper and trade paper experience. The experience thus gained will prove invaluable in studying conditions in the West.

Before entering journalism Mr. Byers had a varied experience, all of which has helped him in making a success of his work in connection with trade papers.

Mr. Byers studied engineering under Professor William Robinson at Nottingham University, winning two scholarships there and graduating in 1906.

In June of that year Mr. Byers sailed for the United States, where he obtained his first position with the Sullivan Machinery Co., manufacturers of mining machinery, Claremont, N.H. After seven months in their shop, he was sent to operate their coal cutting machines at Wind Rock, Tennessee. For eight months he worked in and around various mines in the Southern States, and returned north in the winter of 1907 to Cincinnati, Ohio, obtaining a post with Allis-Chalmers & Co., in their electrical shops.

In 1908 he visited his home in England, and, on returning, worked for several months in the shops of the Vermont Farm Machinery Co. at Bellows Falls, Vt. It was while here that the Semet-Solvay Process Co., with whom Mr. Byers had been associated in Ensley, Ala.,

made him an offer to go to Detroit, there to conduct tests on their coke ovens, with a view to taking charge of a battery of new ovens which they were erecting. He accepted the post, and was with the company the greater part of 1909.

As winter approached, a temptation came to enter the journalistic field. Up to this time, Mr. Byers had never seen the editorial sanctum.

He went to Ottawa and secured a posi-



tion on the Evening Journal. In August 1910 he received an offer to join the staff of the Hamilton Spectator and accepted, remaining with the latter paper until the following year when he went to England for the coronation and returned to Canada just prior to the general elections. Because of his knowledge of the French language he was given a position on the editorial staff of the "Daily Witness," before long being appointed telegraph editor. He later became assistant to the city editor. After spending eighteen months with the "Witness" Mr. Byers joined the editorial staff of the MacLean Publishing Company, on the trade and technical papers with headquarters at the Toronto office.

The Wallaceburg Brass and Iron Mfg. Co., Ltd., have increased the capital stock from \$40,000 to \$250,000.

SANITARY ENGINEERING AND ARCHITECTS' DEPARTMENT.

(Continued from page 11.)

At this day our medical faculty are attaching a great deal of importance to the proper ventilation of our buildings, and heating and ventilation are so closely allied to each other, that they will in 99 cases out of 100 be governed by each other. Then our bathrooms are required to be ventilated by means of local vent pipes, so that, taking things all in all, the sanitary, heating and ventilation will in the very near future, require to be considered jointly. The trade as a whole are sanitary heating and ventilating engineers, and their work no doubt should be under the entire jurisdiction of the civic health department.

The writer could cite scores of cases where buildings are even at this date being planned without any consideration being given to ventilation, and can also quote cases in which some of the largest architects have specified too much radiation as well as too little.

Now these statements are only made to show that it requires the skill of a practical heating engineer to specify what radiation is, or is not required in buildings of certain classes, and we hope in the near future to see our heating and ventilation under the authority of our boards of health as well as the sanitary engineering.



NEW PLUMBING BY-LAWS FOR MEDICINE HAT.

A new plumbing by-law is being prepared by the city solicitors in consultation with Building Inspector Daly, which will be presented to the city council at the regular meeting on Monday night. The present by-law has gotten sadly out of date, and the inspector is of the opinion that a new one should be drafted at once. He has been at work for some time on a new building by-law, which will also be presented as soon as it can be put in proper form by the city solicitor. The present building by-law gives very little power to the city, and is on the whole quite a hindrance to proper inspection and control of building operations in the city.



The H. Mueller Mfg. Co., Ltd., Sarina, have increased capital stock from \$300,000 to \$500,000.

Sewage Disposal: A Modern Miracle

Under Proper Conditions Germs Perform Wonderful Task in Few Minutes—Process of Resolving Sewage Into Its Original Elements Clearly and Simply Described.

Dr. T. A. Starkey, Stratheona professor of hygiene at McGill University, delivered the seventh of his series of lectures recently on "General Principles of Public Health," giving a clear and simple explanation of modern scientific methods of sewage disposal. In his previous lecture he had pointed out the functions of germs in sewage treatment, the anaerobes, or non-breathing germs, attacking the sewage and rapidly liquefying the solids and the aerobes, or oxygen-breathing germs, then resolving the organic matter in the sewage into the chemical end products, such as nitrates, chlorides, etc.

There were two ways of feeding crude sewage to the germs, one being the addition of a coagulate to the sewage, which was known as the chemical precipitation process. This secured a clear effluent, but the disadvantage was the precipitation of the solids in the form of sludge, which, though a good fertilizer, was not held in favor by farmers, so that it was impossible to dispose of the thousands of tons which accumulated. Dr. Starkey knew of only one municipality, Kingston-on Thames, near London, where this method was successfully practised.

The other and more successful method was by subjecting the sewage to the action of the anaerobic germs for about eighteen hours in air-tight septic tanks, where all solids were dissolved. The resultant liquid was then exposed to the aerobes, this original method being known as the land treatment, which, in fact, had been nature's method of disposing of sewage ever since man appeared on earth.

Sewage-sick Soil.

Sometimes the crude sewage was applied to the soil, without first submitting it to the liquefying action of the anaerobic germs. There was, however, a limit to the amount of sewage which ordinary soil could dispose of, and when too much was applied the soil became "sewage-sick." Farmers recognized this principle when they regulated the amount of manure fertilizer applied to a given area of land, as the soil could digest only a certain proportion of the manure. When too much sewage was applied to the soil, the surface became covered with solids, which prevented the air and the aerobic germs from penetrating the soil, and so the germ process was not accomplished, and, roughly speaking,

not more than 4,000 to 5,000 gallons of sewage per acre could be treated by the soil method. If the sewage was in liquid form, clarified by the anaerobic germs, the soil was penetrated more quickly. It had been found, however, that much more satisfactory and expeditious results could be obtained by the construction of contact beds from such materials as coke or clinkers, which by their large interstices permitted the free circulation of air, the multiplication of aerobes, and the rapid percolation of the liquid effluent. When the sewage was equally distributed over these contact beds, the result was little short of miraculous, for in the two or three minutes required for the liquid to trickle through the beds, the billions of aerobic germs performed their task of resolving the dissolved solids into their end products, and the effluent was absolutely clear water, free from all organic matter.

This water, however, still contained germs, although the removal of the solids deprived the germs of their natural food and so resulted quickly in their diminution by more than half. To secure complete purification of the effluent, the same methods might be employed as already described for the purification of drinking water supplies. The water could be filtered by the slow sand filtration process, but this was so expensive that it was practically never used.

An Absolute Failure.

The remaining method was by chlorination with chloride of lime, which was a powerful disinfectant and germicide. Dr. Starkey pointed out, however, the common fallacy held by many that chlorination was a sufficient means for treating raw sewage. The chlorine gas, he explained, always attacked the solids before it attacked the germs, and so if only a limited amount of chloride was introduced, it expended its force upon the solids, and the germs escaped. To kill the germs under these conditions it was necessary to use an enormous amount of chloride, and even then there was no certainty that all would be destroyed, as the chlorine could not penetrate the larger masses of solid matter. Treatment of crude sewage by chlorination, declared the lecturer, had, therefore, proven an absolute failure. For the same reason it was impossible to completely purify by chlorination any lake or river water into which crude sewage had been introduced.

LAWS ON PLUMBING ARE CHAOTIC

"In the Dominion of Canada we have no recognized universal standards regarding sanitary plumbing and ventilation, but are governed by a multiplicity of laws and by-laws, adopted by the governing bodies of our cities and towns and enforced according to their own interpretation." With these words, Mr. John W. Bruce, General Organizer of the United Association of Plumbers and Steamfitters, prefaced an address at the fifth annual meeting of the Commission of Conservation on the subject of the present chaotic state of sanitary law in Canada, and the need for its unification.

In the course of his address, Mr. Bruce emphasized the importance of sanitary plumbing in its relation to public health. He compared Montreal, with a death rate of 20 per thousand, with Toronto, which has a death-rate of 12.8 and attributed the difference in large part, to the more lax enforcement of sanitary regulations in the former. In many hotels, he said, there were not enough conveniences, neither were they kept properly clean. In apartment houses, conservation of space was such an important item that ventilation was sadly neglected.

He blamed speculative building for the unsatisfactory conditions in many private houses. The speculative builder considered outside appearance more than proper sanitation. Inspection was very necessary in workingmen's houses, as these men were less able to protect themselves against the negligence of unscrupulous builders.

A great need, very much overlooked in Canada, was public comfort stations. These should be erected not merely in parks and pleasure resorts, but in the busiest portions of our cities, where the need was greatest. As it was, hotels and public buildings had to bear a burden that the cities themselves should shoulder, with the result that the conveniences in these places were sadly overtaxed. Sanitary drinking fountains should also be provided at public expense.

In conclusion, Mr. Bruce pointed out that satisfactory conditions would never obtain so long as each city or town had its own regulations. Plumbers traveling from one place to another had to familiarize themselves with new laws, and sometimes to pass new examinations in every place.

The Sanitary Engineer

Plumber and Steamfitter of Canada

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TORONTO, MARCH 1, 1914

SAFETY FIRST.

ALMOST every large manufacturer or manufacturing company are adopting the slogan of "safety first."

They are requiring every conceivable device to be attached to dangerous machinery. They are placing large signs near machinery of a dangerous nature, with the words "Safety First" either printed or painted on them. These signs are being placed at gateways, near car-crossings and over doorways entering large workshops, all with a view of preserving the lives and limbs of their employees and other persons who have to visit these large shops in the various pursuits of business.

But what are sanitary engineers doing along these lines? and what should they do? Here are a few suggestions: first place a large sign in your window with the words "Safety First" upon it, and show how your customer's life may be preserved by having you install their heating, ventilating and plumbing. Let "safety first—price next" be your motto. Sanitary engineers have it in their hands to raise the efficiency of the whole human race, by installing good sanitary engineering in every sense of the word. "Safety first," should be the slogan of the sanitary engineer. See that a building is going to be well heated and properly ventilated, ask the owner whether he would rather live a short time in a beautifully furnished home, or enjoy long life in a less beautifully furnished home. Then show him your method of adopting safety first, by installing A1 goods in a proper manner, and by using such arguments you will, without doubt, accomplish much.

A SPLENDID MOVE.

THERE are several of the most prominent members of the craft in and around Toronto considering a plan whereby they can assist the apprentices employed by them to devote more study along lines of sanitation, heating and ventilation, and quite a number of them stated that in the near future they expected to

adopt a system of allowing each apprentice a certain number of hours off to attend the Technical School during working hours. These boys would be paid their time just the same, and it is felt that such a system will fully repay those who adopt it, by way of raising the standard, as well as the dignity of those engaged in the trade. Not only so, but a better class of boy will be available, too. At present it is very difficult to get educated boys to become sanitary engineers.

Not long ago the writer had some conversation with the father of five boys, two of whom were soon to leave school. In discussing the question of their future calling the writer suggested that one or both should take up sanitary heating and ventilating engineering, whereupon, the parent stated he would rather see them buried. Now while such an answer is rather crude, there are scores of parents who would never dream of asking their sons to take up our calling, simply because they have formed a wrong impression of those engaged in it, and it will require no small amount of education before they can be convinced how erroneous such impression is.

CONVENTION CHAT.

IN a month from now you, reader, will have the report of the Ontario Convention placed in your hands. You will receive, as it were, a report of what has taken place in the sanitary and heating business as applied to the business during the period which has gone since the last Ontario Convention. The Programme Committee are now busy drafting out a series of events which will take place. There will be interesting papers read and various suggestions will be given by members of the society. The Workmen's Compensation Act will be discussed. Several matters will be put before those present in connection with a provincial plumbing code. The apprenticeship system will receive some consideration, and, all in all, this coming convention should be the "top-notch" of any ever held by the Ontario society. Hence, it behooves each member of the craft to attend it.

Who Owns the Press of Canada?

THE following editorial from Printer and Publisher bears on a question of vital importance to the retail merchant. The daily newspaper is the medium by which the merchant reaches the public, and its position and its ownership are matters that affect him directly. In the interests of the retail classes, it would appear advisable that the ownership of newspapers be made public. The editorial in question reads:

The question of newspaper ownership in Canada is a very live one at the present time. The public appear to be keyed up to a pitch where they are ready to believe almost anything and apply it to the press of Canada in general. Especially is this true in the big cities, where powerful industrial and financial corporations are constantly at work to secure their own ends. Quite a number of the metropolitan city dailies decline to say who are their owners or make transference of stock to other parties and enter certain amounts "in trust" in their list of shareholders. An illustration of the latter kind was brought to light recently by Toronto *Telegram*, which sought to have the public attribute certain ulterior motives to its two evening contemporaries, in connection with the stand they took on the municipal situation. A complete list of shareholders of the papers in question, the *News* and *Star*, as filed with the Registrar of Joint Stock Companies, was published.

In the case of the *Star* it was noted that stock to the value of \$65,300 was held in trust by E. T. Malone and J. E. Atkinson. The stock personally owned by these two gentlemen brings the total of the four amounts up to \$114,900, or considerably over half of the total capitalization. It is understood that the two trust amounts represent stock owned by the T. Eaton Company and the estate of the late Senator Cox. It is said the block of \$17,700 in the name of Wm. Mulock, Jr., was secured by Chief Justice Sir William Mulock at the time he held the office of Postmaster-General.

Turning to the list of *News* shareholders we find its capitalization much higher than that of the *Star*. One very large amount and two smaller ones, aggregating \$135,200, are held in trust. It is charged that these amounts are owned by manufacturing and financial interests who do not wish to disclose their identity. The largest individual shareholder is J. W. Flavelle, who owns \$92,900 worth of stock. As is generally known, Mr. Flavelle is head of the William Davies meat packing company, which also operates a chain of retail meat stores. He is also a director of the Robert Simpson Co. department store.

It must be admitted that the secrecy surrounding the ownerships and part ownerships of the newspapers mentioned herein and also a number of others, is a matter for sincere regret on the part of the press of Canada as a whole. It should be said, however, that because certain shareholders see fit to take advantage of their privilege and place their stock in a trust account, it does not necessarily follow that they or the newspaper are guilty of any wrong-doing. The fact is, public opinion has been aroused and where the slightest suspicion of unworthy motives exists the public is inclined to arrive at hasty conclusions. But the public can scarcely be blamed for exaggerating—that is the best way they know of for showing their extreme disapproval. They naturally feel they have a moral right to know the names of those who are directing their opinions in order that they may be in a position to judge the value of the advice given.

It is of vital importance that the question which forms the title to this article be answered if the good reputation of the press of Canada is to be sustained. The enactment

and strict enforcement of postal legislation, similar to that which is in force in the United States, which compel the publication of complete details of ownership, should provide an efficient remedy.



LECTURE TO SANITARY HEATING ENGINEERS.

THIS lecture was conducted under the auspices of the Toronto branch of the Canadian Domestic Sanitary and Heating Engineers, and was given in the auditorium of the Canadian Order of Foresters' Hall, College street, on Monday, February 16th. It was well attended by all the members of the society, and several others. Mr. LeGrow opened the meeting with a few appropriate words and at the same time introduced the lecturer to the audience. Professor Mackay received the earnest attention of everyone present. He stated that he was not there as a professor of sanitary engineering, nor was he going into any of the technicalities which were embodied in that industry. He stated that he himself was surprised at the huge feats which had been accomplished by those men who were engaged in the calling, and who had been endowed with so little cultural education. He spoke of sanitary heating and ventilation as being one of a vital nature, and one which was a calling of great responsibility. He showed what the aims and objects of the technical schools were, and in many ways proved that technical education was really education practically applied. He told his hearers that one-third of our taxes were applied to educational matters, all of which were more of a professional nature, and that practical education was the only means of raising the standard of the industrial worker. He showed how the average schooling did not appeal to the average boy. But that an industrial and technical education does appeal to our boys. Such teaching as a boy receives in a technical school makes him love tools, makes him love to use them in making things, and also knowing how to make things.

He then went on to say that Toronto, as an industrial centre, produced one-third of the actual manufactures of the whole of Ontario, and one-fifth of the whole Dominion, and that the values of manufactures, such as were produced by the industrial worker, far exceeded the values of agricultural produce. That financial statistics would easily prove that Canada was not an agricultural country by any means, and that while such vast sums were being spent on educational matters, few of the industrial workers, had, up till recently had the opportunity to take advantage of technical education. That technical education was for the producer or industrial worker, and the technical school would be the friend of the industrial worker, if they could take advantage of such education. Referring to sanitary heating and ventilating, and those engaged in that business, he stated the coming men would require a wider range of knowledge along all lines, than men of any other calling. Wm. Meadows, chief plumbing inspector of Toronto, proposed a vote of thanks, Mr. Mansell seconded the motion.

Several other gentlemen present joined in at the close of the meeting, and one and all left the meeting with a feeling of great satisfaction and thanks to Professor Mackay for the able way in which he held the attention of each present.



TOPICS IN SPRING NUMBER.

PARTIAL list of subjects which will appear in the first special Spring Number of Sanitary Engineer.

- Heating and ventilation.
- Pumps and their use, etc.
- A discussion on simplified plumbing.
- Domestic hot water supply.
- Sanitation, a problem for the Federal Government.
- Full report of the Ontario Convention.

Montreal Sanitary and Heating Engineers' Annual Dance

A Brilliant and Most Enjoyable Event—Large Number Present,
Which Speaks Well for the Craft in Montreal.

The annual dance and euchre held recently in Majestic Hall, Guy street, Montreal, by the Montreal Sanitary and Heating Engineers' Association proved a huge success, both from a financial and social standpoint. About 250 ladies and gentlemen were present and enjoyed the evening immensely. Two hundred took part in the euchre and after the winners had been decided magnificent prizes were distributed to the lucky ones.

Supper was served in the spacious room below the hall and to say that the decorations and general effect were very striking would be putting it mildly. Many of those present were quite loud in their praise for the work of the committee whose efforts were not unrecognized. L. H. Howes, of Westmount, had charge of the catering and carried out his end of the programme faultlessly.

Dancing was indulged in until well on into the wee small hours of the morning and included all the popular and most approved styles. The music, which was rendered by Prof. A. R. Brown's orchestra, was most appropriate and included all the latest and most up-to-date "hits" of the present season, as well as quite a number of the older favorites.

The committee in charge must be complimented on the way in which they carried out the different arrangements as everything went off without a hitch. Indeed, the majority of the crowd stayed until the last note had died away, so well did they enjoy the evening.

Mr. Joseph Thibeault, past president of the association, was the chairman for the occasion, and on the reception and other committees were Messrs. James Ballantyne, J. E. Walsh, W. R. J. Hughes, J. A. Gordon, John Watson, Ryan, Conroy, Laurier.

The following were among those who were present: Mr. and Mrs. James Ballantyne, Mr. and Mrs. L. J. Conroy, Mr. and Mrs. Wilfrid David, Mr. and Mrs. John A. Gordon, Mr. and Mrs. W. J. Graham, Mr. and Mrs. W. R. J. Hughes, Mr. and Mrs. Jos. Laurier, Mr. and Mrs.

E. C. Mount, Mr. and Mrs. P. C. Ogilvie, Mr. and Mrs. G. Ogilvie, Mr. and Mrs. Walter Ryan, Mr. and Mrs. Jos. Thibeault, Mr. and Mrs. J. E. Walsh, Mr. and Mrs. John Watson, Mr. Jas. A. Sadler, Mr. and Mrs. Jas. B. Staton, Mr. C. Watson, Miss Watson, Miss Watt, Mr. and Mrs. E. H. Lydon, Mrs. Houghton, Miss Gordon, Miss F. Gall, Mr. A. Thibeault, Miss Thibeault, Thos. McGrath, J. A. Roy, Miss J. Drouin, Miss C. Drouin, Mr. and Mrs. John Hughes, A. Walsh, Mrs. Tracy, Miss R. Courcelle, J. E. Courcelle, Mr. and Mrs. Wm. J. Cooper, Miss G. Denman, J. Morrison, Miss D. Reith, Mr. and Mrs. P. A. Connolly, Mr. and Mrs. W. H. Edwards, Walter Livermore, Mr. and Mrs. J. W. Dagnall, Geo. A. Pratt, A. D. Kelley, Mr. and Mrs. J. Johnstone, A. H. Milne, Miss Murray, Mr. and Mrs. W. P. Baxter, Jas. R. H. Pratt, Miss M. Common, J. E. Couillard, Mr. and Mrs. H. Charbonneau, Miss A. Robert, J. J. Conlin, J. J. Doyle, Miss Doyle, H. C. Hodgson, C. Forbes, Miss A. Cote, Gaston Bourassa, Mr. and Mrs. V. A. Trengove, Frank J. Kearns, Walter M. Maguire, Miss C. MacLeod, Mr. and Mrs. John Smith, J. A. Labelle, H. A. Matley, W. Carragher, Jas. P. Kennedy, Aug. Comte, H. A. Lamontagne, Miss B. Lamontagne, Miss E. Thomas, C. H. Pratt, Miss G. Aubrey, A. L. Lamontagne, J. E. Blanchard, E. Mondehard, S. G. Bourne, R. V. Whimbey, Miss Lamontagne, Geo. Lalonde, R. T. Hogan, Albert G. Stewart, Miss A. Gordon, L. A. Wadden, Miss H. Asselin, Mr. and Mrs. W. G. Burgess, W. M. Beaumont, Mr. and Mrs. Thos. Orme, A. C. Davidson, D. Lanouette, Ernest Tessier, Mr. and Mrs. L. A. Tessier, J. B. Fortin, Jean Tessier, J. McOedle, L. M. Giasson, J. C. Tessier, H. P. Johnson, Mrs. M. Johnson, T. P. Senecal, Maxime Brunet, C. A. Sullivan, P. Crepeau, Mr. and Mrs. John J. Milne, Mr. and Mrs. J. A. Elder, H. F. Cole, Paul B. Lalonde, John J. Coreoran, H. Bonham, H. Sockett, D. Rausse, Mr. and Mrs. O. J. Delaney, Thomson Robertson, J. A. Burgess, Miss A. Meean, J. F. L.

Carron, A. L. Booth, G. E. Cree, O. T. Webster, Miss M. Greig, Arthur Bury, Miss A. Gillard, Mr. and Mrs. R. O. Gardner, B. Burgess, C. E. Cahill, P. E. Baker, R. Delude, W. E. West, John A. Greig, T. Lusignan, Mr. and Mrs. J. J. Hamel, Miss Hamel, Mr. and Mrs. J. H. Hebert, Mr. and Mrs. J. Hebert, W. Tabbiner, J. Loranger, Miss Loranger, Dr. R. Tessier, J. Chartier, W. H. Steele, Jos. H. Belisle, Mr. and Mrs. Jos. Lamarche, J. F. Lemieux, Ed. Beliveau, J. Stanley Farlinger, and others.



NEW BOOKS.

A new book is being issued by Veritys, Ltd., Plume and Victoria Works, Aston, Birmingham, England. It deals with all kinds of electric heating devices, one feature which would be of most interest to the sanitary and heating engineer is a water heater. They claim it will heat water very quickly as well as filter water not heated. Those of our readers who would like to procure one of these books should write to the above address. The whole book is full of interesting and valuable information.



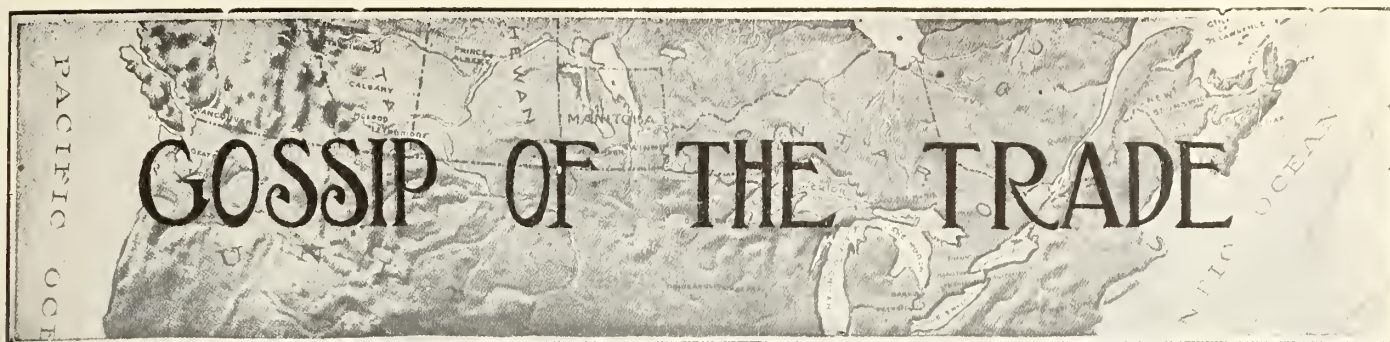
BOOK ON VACUUM CLEANING.

Our circulation department have recently added another very good book to their stock. It is a splendid addition. It is written by one of the highest authorities of the science of vacuum cleaning, M. S. Cooley, M.E., mechanical engineer in the office of the supervising architect, Treasury Department, Washington, D.C. This valuable book should be on the bookshelf of every sanitary engineer. It is well bound and beautifully illustrated. Drop a card for further particulars to Technical book department, MacLean Publishing Co., Ltd., 143-9 University avenue, Toronto.



If we were permitted to choose our neighbors, they would probably turn out just as unsatisfactory.

Don't forget to attend the Ontario Convention
March 19, 20, 21.



REGINA TO HAVE NEW SEWAGE PUMPING STATION.

One of the new undertakings which the city will have to establish this year as a result of the outward growth of population is a pumping station to handle sewage from houses which have been built during the past year or two in Riverside and other property west of Albert Street, near the creek.

In this vicinity there is quite an extensive area which cannot be drained into the Wascana Valley trunk sewer, being below the level of the main. All the sewage in this area will be collected at a given point to be decided upon by the engineers, and pumped into the trunk sewer. No difficulty will be experienced in handling sewage from the south side of the creek, as the property is high enough in Lakeview to allow the sewage to be siphoned under the creek into the trunk main on the north side, and this is being done at the present time.

Provision for the equipment of a pumping station is being provided in this year's estimates of the works department, and it is the intention to establish the station some time during the present summer.

TO ESTABLISH HEALTH DEPT.

Sherbrooke, Que.—A largely signed petition was presented to the city council last evening to establish a health department.

SUFFERED FIRE LOSS.

The establishment of Messrs. Higgins & Orpwoods, sanitary and heating engineers, 185 Main street, Moose Jaw, caught fire recently and but for the prompt action of Fire Chief Barnes and his corps the loss would have been more serious.

BIG INCREASE OVER 1912.

The people of Barrie, Ontario, spent \$28,296.00 on new plumbing work in 1913, which was an increase of \$17,152.00 over the year 1912. The value of building permits taken out for new buildings,

etc., totaled \$170,535.00, showing an increase over 1912 of \$78,073.00. It may be concluded that the town of Barrie did not feel the year 1913 to be dull in any sense of the word.

NEW SEWAGE DISPOSAL PLANT.

Port Arthur is considering a large sewage disposal scheme, and has taken the matter up with the Provincial Health Department.

BOILER EXPLOSION AT OTTAWA.

A DISASTROUS boiler explosion occurred on the morning of January 21 at the Howick Hall, Ottawa, when three men were killed, five severely injured, and several valuable horses perished. The Eastern Ontario Live Stock Show was being held at the time, which accounts for the presence of the horses. The hall is a steel and concrete structure, with an annex, about 150 yards square at one end, built of wood. It was under this section that the boiler and heating plant were located.

The boiler was of the return tubular type, 60-inch diameter by 14 ft. long, and had 82 3-inch tubes. It was made of Carnegie steel plate of 60,000 T.S., 5-16-

inch thick, the heads being 3/8-inch thick with 1 1/8-inch longitudinal stays. The longitudinal seams had double riveted lap joints with 3/4-inch rivets, 27/8-inch pitch. The girth seam was a single-riveted lap joint having 3/4-inch rivets, 2 1-16 inch pitch. The safety valve was of the lever and ball type, 3 1/2-inch diameter. The boiler failed at the manhole ring, which was of cast iron, and through the front shell plate in a longitudinal direction.

At the official enquiry, held to investigate the cause of the explosion, the jury brought in a verdict to the effect, "that the explosion was caused by excessive steam pressure and that the safety valve and steam gauge were defective." According to the specification, the boiler was good for 65 pounds working pressure, but it had been operated at a lower pressure, usually around 20 pounds, and was used for supplying steam to a low pressure heating system. We are indebted to Mr. D. M. Medcalf, chief boiler inspector of the Province of Ontario, for the constructional details and accompanying photographs. Mr. Medcalf made an examination of the wrecked boiler on behalf of the Provincial Government.



REAR SECTION OF BOILER AFTER EXPLOSION.

Analysis of Canadian Sanitary Engineering Bylaws

In Our Recent Issues We Have Taken up Several By-laws, Viz., Ottawa, Montreal, Toronto and Calgary—We Will Now Comment on the Plumbing By-law in Force in Fort William, Known as By-law No. 1,181.

IN our last issue we were discussing the by-law which is in force in Fort William and closed by commenting on clause 5, therefore we will now take up the next clause.

Clause 6.

This clause is general and is embodied in almost all city sanitary by-laws, it refers to the connection between the sewers and house drains, and demands proper increasers when iron soil pipes are to be connected with tile drain pipes, It also requires that no trench be filled in before being passed by the plumbing inspector.

Clause 7.

We find several matters of importance in clause 7, which reads as follows:—

Each block or building shall have its own separate soil pipe until it passes outside the wall. Cleanout screws or inspection pieces must be placed at foot of vertical soil pipe, base-bends with cleanouts to be used whenever possible, and on drains near exit to sewer, in such a position as to be easy of access for cleaning rods, also all branch waste pipes on drains shall have cleanouts at ends. All floor drains or rain water drains shall be brought to floor levels, in cases of houses built on sills or piers, the cleanout for drain to be brought up to an accessible position, so that cutting or digging will be eliminated.

Here is a clause the meaning of which would be better illustrated by plans of what would or would not be allowed, for instance, the very first sentence is scarcely clear in every way. It states:

“Each block, or building shall have own separate soil pipe until it passes outside the wall,”

Now this sentence may mean several things, according to what is meant by “a separate building” or “a block.” In some cities, a block consisting of two houses, would be defined as two houses, and two bathrooms would then be necessary, and also two separate soil pipe stacks and drains would be required, then again in that same city a block could be an apartment building with almost any number of suites of apartments in it, and which would also demand an equal number of bathrooms, in such a case it may be necessary to instal several soil pipe stacks as well as drains, and it may be necessary to re-

quire more than one main drain connection to the main sewer. Thus it will be seen that a few plans would be much clearer than the actual wording of this sentence.

The other portion of this clause is pretty clear until we read, “In cases where the houses are built on sills or piers, the cleanout for drain to be brought up to an accessible position, so that cutting or digging is eliminated.”

Here is another instance where a plan would fill the bill far better than words. We are here showing a plan which we understand is being followed out in several cities in Canada, and which allows for no further argument, and is practical. See Fig. I.

Clause 8.

This clause is one which deals entirely with the sizes and weights, etc., of the various materials which are required in

pipe connections thereto shall be made by brass ferrules with caulked and wiped joints, all fittings, bends, traps, etc., to correspond in weight and quality to soil pipes used. No inverted joints shall be allowed below the fixtures.

All cast iron pipes and fittings shall be sound and smooth, and free from all sand holes, cracks or other defects.

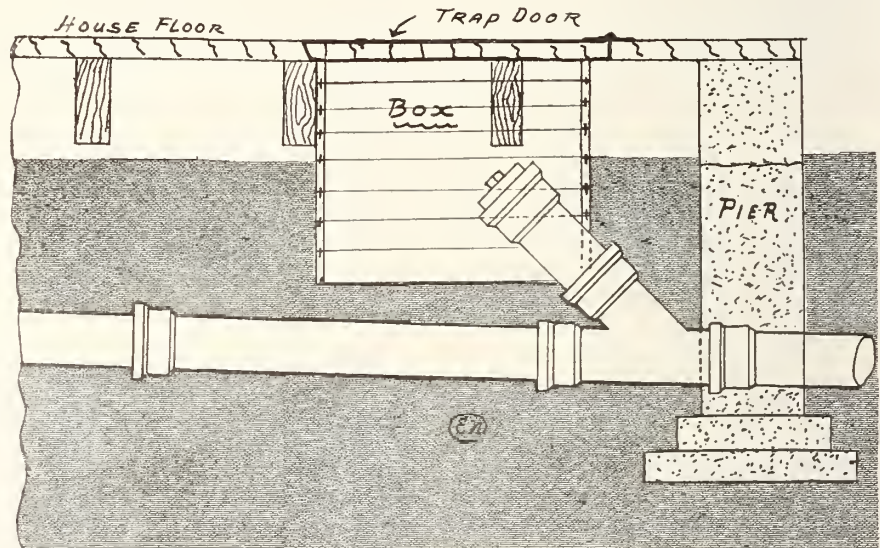
The weight of brass ferrules and soldering nipples shall be as follows:

Brass Ferrules.

4 inches	3 lbs.....	4 inches long.
3 inches.....	2 lbs.....	4 inches long.
2 inches	1½ lbs.....	4 inches long.

Brass Nipples.

2 inches	14 ounces.
1½ inches	8 ounces.
1¼ inches	6 ounces.



Showing box around the clean-out at foot of stack.

the installation of sanitary engineering. We here reproduce it:—

If soil pipe are of cast iron, they shall be spigot and faucet pipes, of medium quality weight and joints to be caulked with lead. The depth of lead forming the joint to be at least two inches, all offsets for branch connections shall be made with Ys, and eighth bends, except the closet branch, which may be a T Y or continuous venting of fixtures, a continuous vent shall not be more than two feet six inches from the stack, and any lead

Lead Waste Pipes.

1¼ inch	2 1/3 lbs. per ft.
1½ inch	2 2/3 lbs. per ft.
2 inch	3½ lbs. per ft.
4 inch w.e. bends.....	1/8 in. thick.

Waste from fixtures shall be the following sizes:—

Water closets.....	4 inches in diameter
Sinks	1½ to 2 inches in diameter
Slop sinks...	2 to 3 inches in diameter
Laundry tubs.	1½ to 2 inches in diameter
Urinals	1½ to 3 inches in diameter
Baths	1½ to 3 inches in diameter

Basins ... $1\frac{1}{4}$ to $1\frac{1}{2}$ inches in diameter

The latter part of this clause reads as follows:

If wrought iron pipes are used on any part of the installation for soil or waste pipes, the pipes and fittings must be of galvanized iron, and be constructed as specified for the "Durham System."

This portion, however, has been amended for reasons which are here given.

In Fort William it has been found that a large percentage of recessed galvanized fittings are very rough inside and collect foreign matter rapidly, then choke up. Hence the amendment which reads as follows:—

"Black cast iron recess fittings to be used on Durham work."

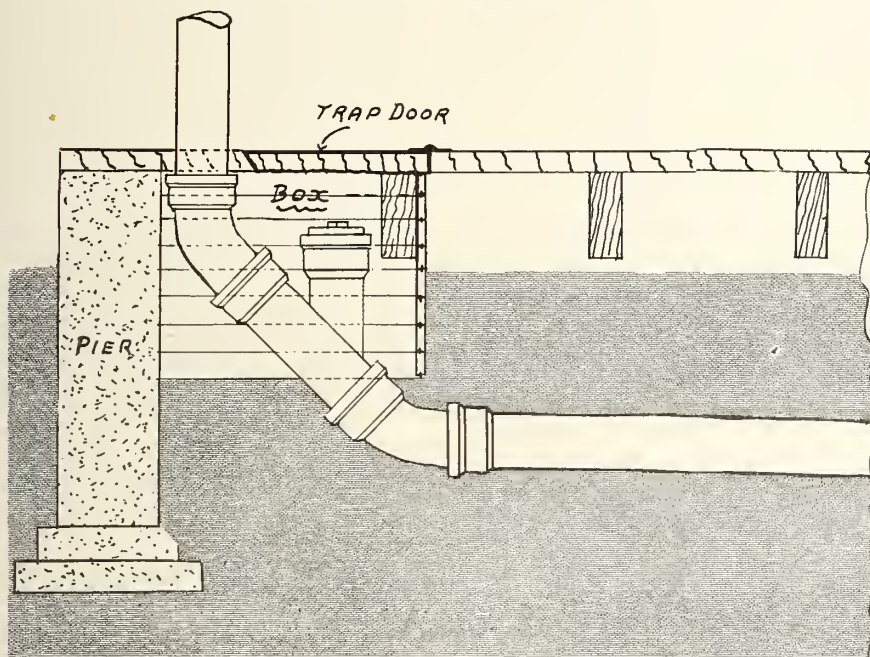
We cannot help commenting upon this amendment, because it sounds so strange to hear of black iron fittings being chosen in preference to galvanized ones. Though we must credit those in Fort William in acting according to their better judgment. We feel, however, that if the manufacturers of galvanized fittings were to exercise more care when

for sewerage facilities in the more congested portions of the district. It has been suggested that a plan for the construction of a sewerage farm similar to that already in existence in Berlin, Ont., might with advantage be gone into, and that this would possibly solve the problem of sewage disposal without making annexation a necessity.



GASOLINE EXPLOSION.

Stratford, Ont., Feb. 23. — Ernest Jarvis, who plies his trade of plumbing at McDermid Bros., Brunswick street, tried to thaw a can of ice with gasoline to-day. The result was a pair of badly-burned legs and some slight alterations to his trousers. He had poured some gasoline on the ice and then set it on fire. Before this had ceased to burn he poured more gasoline. The explosion which followed set fire to the building and would probably have ended Jarvis's life had not a cool-headed fellow-workman smothered the burning clothes with a cloak.



Showing box around clean-out, where drain leaves the building.

galvanizing these fittings, there should be no complaints on that score and we hope to hear of Fort William adopting the use of galvanized recessed drainage fittings in the near future.



SEWAGE FARM SUGGESTED.

Fairbank.—York Township engineers are at present engaged in locating the watershed in the Fairbank district, the plan of which will be submitted to the city engineers for consideration. This is a prelude to the township's request

TORONTO VISITORS.

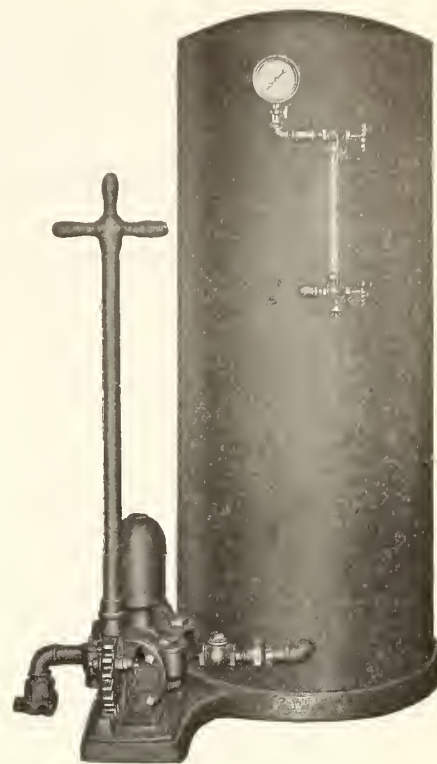
C. S. Forrest, of the James Robertson Co., Ltd., Montreal, and J. M. Callon, of the Standard Sanitary Manufacturing Co., Ltd., were visitors in Toronto this week, and both reported business as being all to be desired at this period of the year.

OPENS NEW ESTABLISHMENT.

Geo. Ross & Co., sanitary and heating engineers, of Brockville, Ont., have opened up an establishment in Smith's Falls. G. Rothwell will be their manager.

WATER SUPPLY SYSTEM.

The General Machinery Co., Ltd., 22 Mulock avenue, Toronto, are placing a new style of water supply apparatus on



the market. They claim novelty in design, efficiency and durability in construction. They are made in two sizes and are electric-driven, automatically controlled and complete, ready for installing.



LADDITE GAS MANTLE.

The Hamilton Gas Mantle Co., Hamilton, Ont., announce that they have purchased the secret process rights for the manufacture of the Laddite incandescent



Laddite Gas Mantle.

gas mantles for Canada, including the registered trade mark Laddite.

It is claimed by the makers that the Laddite mantle maintains its brilliancy upwards of 2,000 working hours. This is said to be due to the action of the Laddite element, which, it is said, prevents the vaporization of the ceria oxide, one of the ingredients used in combination with thorium, the light-giving element.

Problems in Sheet Metal Work

IN Fig. 1 we show a sketch of what is known as a register box or a round to square. Such fittings are very common to the furnace-maker. The same method is necessary when an ordinary square to round taper piece is required for an extension to a chimney except that the square portion is made to fit the chimney. No matter what length the piece is required, from the round to square, the same method is adopted.

We will now turn to Fig. 2. The outer lines are the actual elevation of the article required. E F G H is the portion which is to be square to round. A B C D are simply the collars. Having determined the sizes, make the plan as aforementioned which is really a series of angles. Now erect a vertical dotted line I J and draw dotted lines from E J and F J; then extend dotted lines, or transfer the same measurements as shown in Fig. 3.

Taking M as centre, place compass at J in Fig. 2, and open up to G, this being

the diameter of the round portion. Then make circle as shown, or half this pattern will do, but by drawing the whole as shown, one can see both views in Figures 2 and 3. Next divide the arc as shown, after erecting the various angles, and be sure to have the portions very accurate, as shown in P 1, 2, 3, 4, 5, 6, 7, 8. These lines represent the various angles required as well as the height from I J and G E. We will now turn to Fig. 4.

Draw a horizontal line R S; then place the point of compass at P, Fig. 3, and open up to 8. Transfer this to R and form R S; then repeat with P 7, again transferring this measurement to R 7, and so on until all have been transferred. Then from R erect a vertical line equal in height to J I in Fig. 3. Next draw a series of angles as shown T 3, T 4, T 2, T 5, T 1, T 6, T 7, T 8. Fig. 4. These represent the actual length of the lines in Fig. 3, P 1, 2, 3, 4, 5, 6, 7, 8, which is really only the quarter pattern.

We will now turn to Fig. 5. Using E as centre and with radii equal to the various lines shown in Fig. 4, from T 1 to 8 transfer them to Fig. 5 in small arcs. Next open the compass and mark off these arcs with the spaces on quarter circle, P 1, 2, 3, etc., to 8 in Fig. 3. This completes the stretch-out. Next using L in Fig. 5 as centre and E G in Fig. 2 as radius, describe an arc E i, Fig. 5. Then with E as centre and P K in Fig. 3 as radius, form another arc to intersect arc E i. Then draw a line from I to E i and from there to E, which will give the desired angle to form one-half of one side. Then draw the various lines the desired height, K A A i and B and B i, and so on, which will give the one-half pattern, the outer dotted lines are for the seams. And, if this fitting is required to be made from small pieces, a quarter pattern will be sufficient, except that material must be allowed extra for seams at J 1, Fig. 5, turning the pattern over to form the left or right halves.

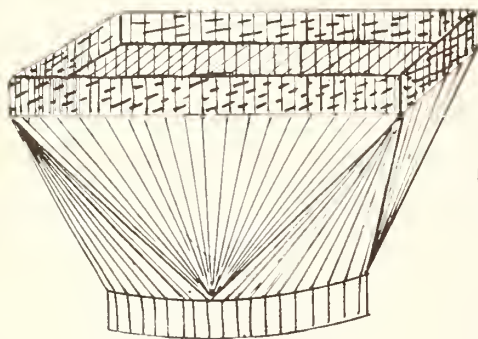


FIG 1

PROBLEM FOR THE
DEVELOPING OF
PATTERN FOR A
REGISTER BOX. VIZ:
ROUND TO SQUARE.

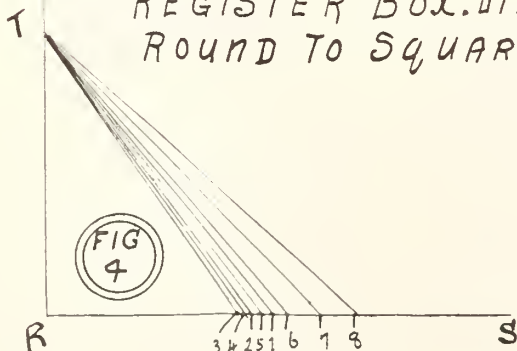


FIG 4

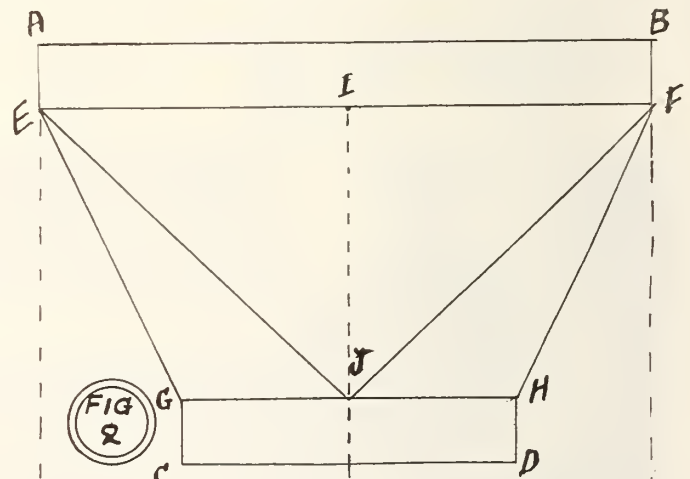


FIG 2

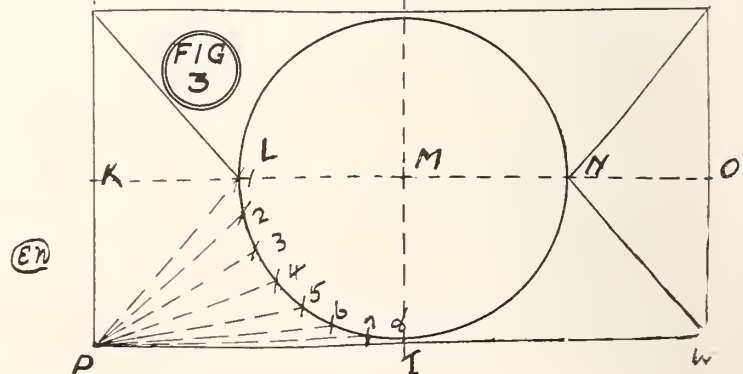
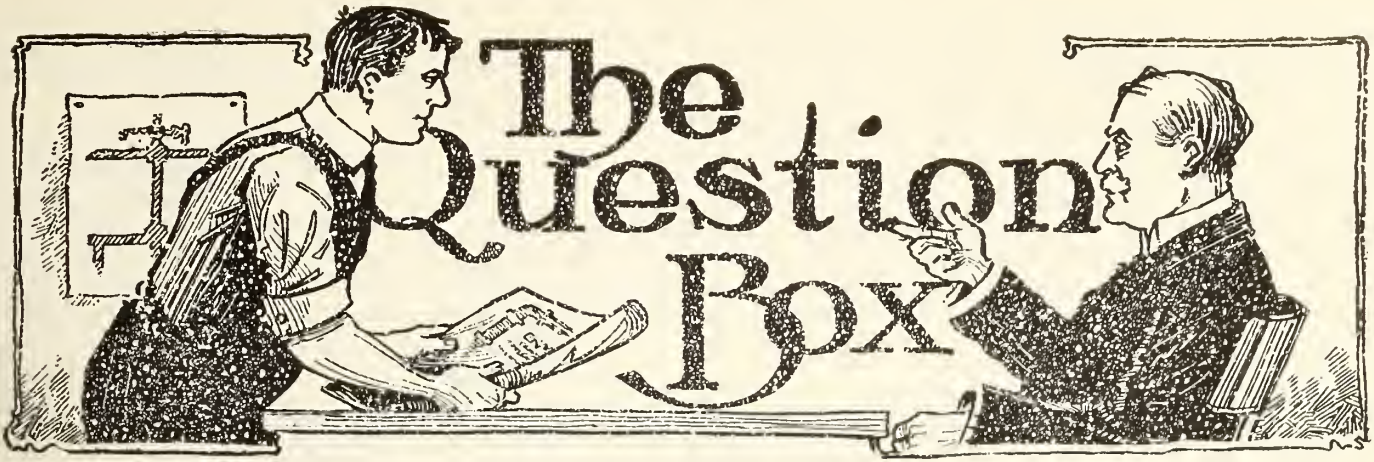


FIG 3

For Fig. 5 See Page 22.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

HOW TO VENT W.C. BOWL.

Editor Sanitary Engineer.—Please inform me in your next issue the proper way to take off a vent for a closet, where there is no place on the fixture.

Subscriber.

In replying to subscriber, we presume by the fixture he means the w.c. bowl. we herewith show in figures A and B how this venting should be done. If there is sufficient room from the top of the lead bend to the underside of the floor the vent should be taken off as shown in figure A. If however, there is not more than three inches the vent may be taken off as shown in Fig. B. Of course if there is a by-law in existence in the city where this work is to be done, there may be some objections to any vent being taken from the lead bend. Some cities demand a cast iron fitting laid on its back with a two-inch branch

struments and draftsmen's tools and supplies.

Thanking you in anticipation, I am,

Yours truly, J. C. M.

Saskatoon.

Referring to J. C. M., we may state he will be able to procure the above instruments from the following firms—Art Metropole, Toronto; Engine Dietzgen Co., Toronto; Keuffel & Esser, Montreal.

Editor.

* * *

WATER BOILS UNDER VARIOUS PRESSURES.

Water boils under various pressures. For instance, water boils at 212 degrees and forms steam, under atmospheric pressure at sea level. It may sound strange, but is nevertheless true, that eggs cannot be boiled at too great a height above sea level under atmos-

pheric pressure. However, such a condition may be overcome in this way. For instance, anything which required 212 degrees Fahr. to cook would need to be placed in some closed vessel so as to generate a pressure which would overcome the conditions caused by the high altitude.—Editor.

* * *

RE-TINNING COPPER POTS.

Editor, Sanitary Engineer.—I am very much interested in the re-tinning of copper pots, and have secured the business from one of the largest hotels in this coast, but up to the present have had small success. The chief difficulty is to get the greasy surface clean. I should be glad if you could tell me which flux would be most advantageous.

Sincerely yours,

A Faithful Reader.

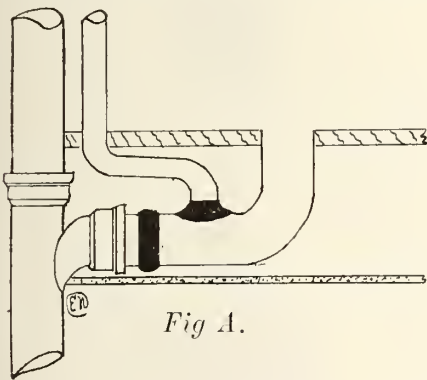


Fig. A.

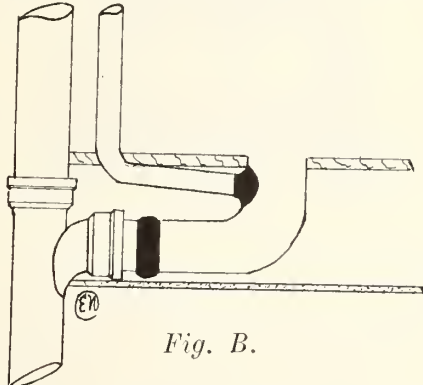
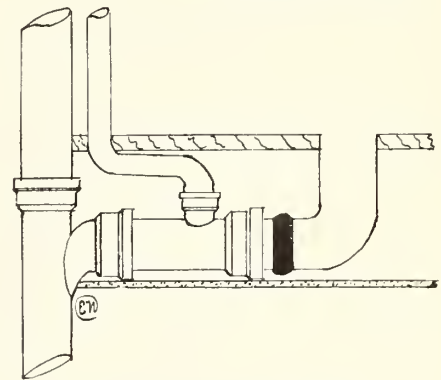


Fig. B.



As required in some cities

looking up, hence subscriber would have to be governed according to the demands of the by-law.—Editor.

* * *

DRAFTSMEN'S INSTRUMENTS.

Editor, Sanitary Engineer.—Could you supply me through the medium of your valuable paper the name of a Canadian firm manufacturing drawing in-

struments and draftsmen's tools and supplies. Thanking you in anticipation, I am, Yours truly, J. C. M. Saskatoon. Referring to J. C. M., we may state he will be able to procure the above instruments from the following firms—Art Metropole, Toronto; Engine Dietzgen Co., Toronto; Keuffel & Esser, Montreal.

In mountainous districts, at high altitudes, domestic cooking is a very difficult task out in the open or under at-

mospheric pressure. However, such a condition may be overcome in this way. For instance, anything which required 212 degrees Fahr. to cook would need to be placed in some closed vessel so as to generate a pressure which would overcome the conditions caused by the high altitude.—Editor.

Replying to A Faithful Reader, no doubt the worst trouble in tinning copper pots is the dirty metal. Not only will he be troubled with grease, and even after it has been thoroughly cleaned, there is trouble in keeping it clean during the process of tinning. The best method to adopt would be, get a strong solution of potash, or lye, and make a swab of rag on the end of a

stick and apply it to the-greasy article, of if it is possible to make the solution in the vessel or pot to be tinned, do so, and boil the solution in the vessel. Then make up a solution of one part sulphuric acid and two parts nitric acid. Use another swab and apply all over the part to be cleansed, then rinse quickly in clean cold water. If the article to be cleaned is very dirty, the lye solution should be made of one-half pint of lye to one gallon of water. The flux to use depends upon the method of tinning. If the article is to be tinned with a copper bolt use resin, if over a fire or gas burner then use killed muriatic acid. To thoroughly "kill" muriatic acid, there should be as much sheet zinc dissolved in it as it will take, then the dirty deposit, or surplus zinc removed. We, of course, presume our reader only needs to tin these pots on the inside.—Editor.

* * *

HOW TO CLEAN SHOP SOILED VALVES, ETC.

Editor, Sanitary Engineer.—"I have been stock-taking and find a lot of new brass goods which are not nickel-plated, very much shop-soiled. Is it possible to clean these valves quickly and make them look better than they do, an early reply in Sanitary Engineer will greatly oblige yours truly.

A Subscriber.

In replying to A Subscriber, we herewith explain. First get two jars large enough for the largest piece to be cleansed. In one jar place one-half pint tin of lye in say one gallon of hot water and when this is going to be used it should be hot as it will act quicker when hot than cold. In jar number two put

two parts of nitric acid to one part of sulphuric acid and mix. This is all. Number one jar with the lye in need only be used if the goods to be cleansed are greasy. Method for cleansing: first, if greasy, hang the article to be cleaned in the lye, then dip it in number two jar and rinse quickly in cold clean water.

If the valves have composition disc, these should be taken out as the acids will destroy them. These dips will make the valves like new.

Editor.

* * *

SEPTIC SYSTEMS, WILL THEY FREEZE IN MANITOBA?

Editor, Sanitary Engineer.—You have lately published several articles on septic tanks. Would you or some of your readers tell me of a practical one that could be successfully used in Manitoba. The temperature here often reaches forty below zero in winter and the ground freezes from five to six feet for most of the winter. The frost sets in about the tenth of November and the ground does not thaw out again till the first of April.

Inquirer.

Replying to Inquirer we beg to state that if he will look up Feb. 2nd issue of Sanitary Engineer he will find a full description of septic tanks. These can be installed as shown and described in any part of Canada. We herewith reprint what Dr. McCullough, M.D., Ontario provincial health officer states in part when referring to septic tanks, which reads as follows:

"In answer to a question which arises in the minds of most people who have given consideration to the system, I may

say that it will not freeze in winter even when the frost penetrates the ground for several feet."—Editor.

* * *

WHO ARE AGENTS FOR SPENCER BOILERS?

Editor, Sanitary Engineer.—We have an opportunity of figuring on a church heating plant and they prefer a "Spencer" boiler. We shall feel obliged if you could give us the name of the agent for these boilers so that we can get their catalogues and prices. Thanking you in anticipation, we are

Yours respectfully,

P. A. Moore,

Hamilton.

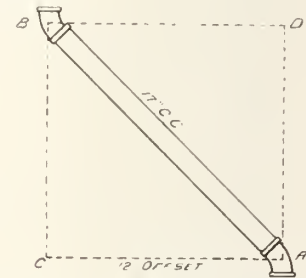
Messrs. Waldron Co., Ltd., Lumsden Buildings, Toronto.—Editor.

* * *

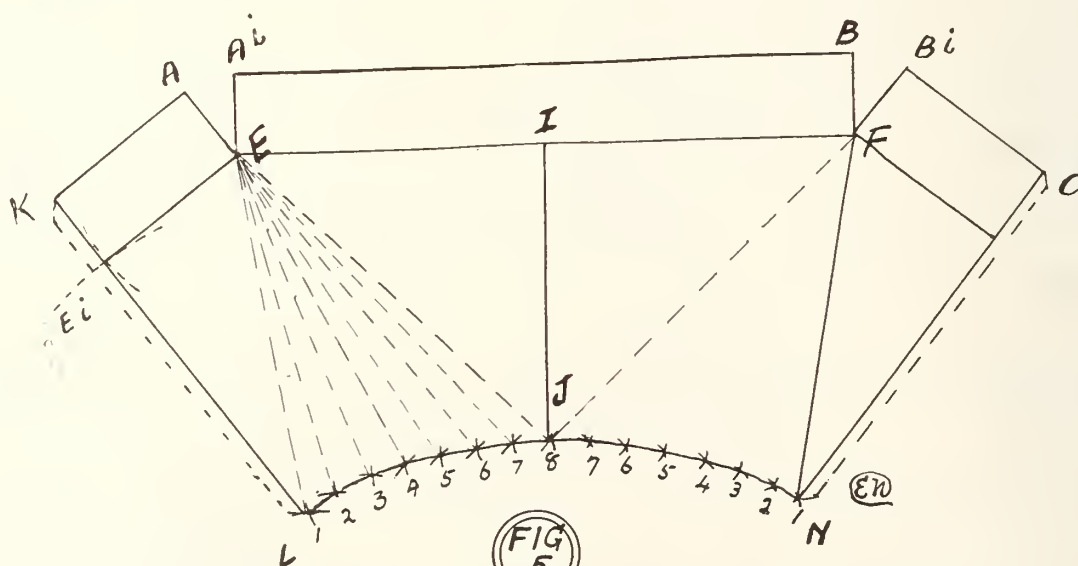
AN EASY 45 DEGREE MEASUREMENT.

Editor Sanitary Engineer:—

Could you inform me in your next issue of Sanitary Engineer, the best and exact way of measuring of degrees of 45.—L.E.P.



We show a diagram in Figure 1, which will more clearly explain our rule. Suppose that you have a 12-inch offset and wish to use 45 degree ells. Desiring to know how long to cut the pipe between the two 45 ells.



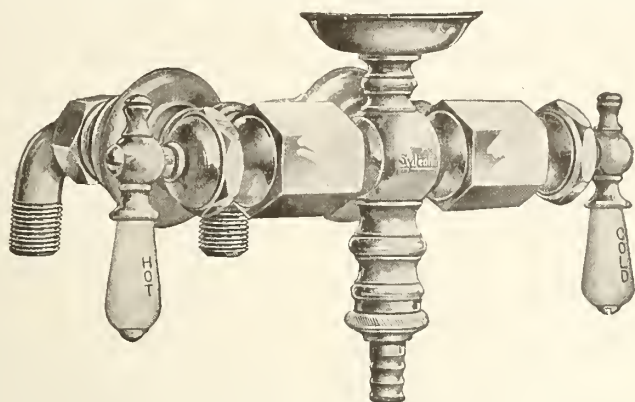
~ HALF PATTERN ALLOWING FOR SEAMS ~

New Sanitary and Heating Goods

NEW BATH COCK.

The Wallaceburg Brass & Iron Mfg. Co., Ltd., are now introducing to the trade a new quick compression double bath cock. They claim the threads are perfectly cut. It is heavier in design

burner that it takes care of all condensation resulting from the use of poor grades of gasoline or the accumulation of heavy gas that is manufactured by the machine and with the long run of piping cools before reaching the lamp and be-



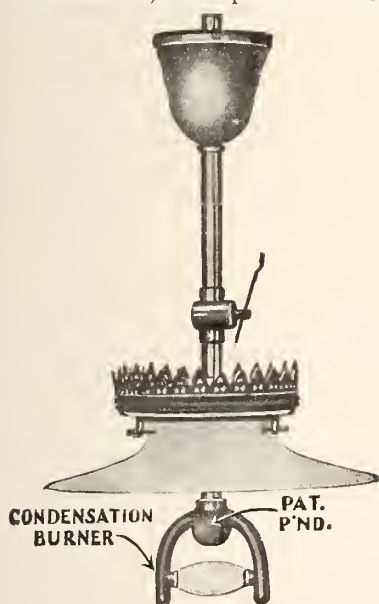
New and Heavy Style Bath Cock.

and made of the best material known to them and can be procured with either solid brass or porcelain handles. Any one wishing for further particulars should write to The Wallaceburg Brass & Iron Manufacturing Co., Ltd., Wallaceburg, Ont.

KING NO-DRIP LAMP.

King Light Co., Peoria, Ill., are offering the Canadian trade their new lamp, here illustrated.

The lamp will be known as the no-drip No. 157. The burner and mantle are the special features, and patents covering



No Drip Condensation Lamp.

both burner and mantle are pending, as well as the design patent on the burner. The manufacturers claim for this

comes a liquid, accumulating little by little at the low point in the piping until sufficient liquid has accumulated, where it runs to the lamp and comes streaming down the lamp and should the lights be on will sometimes blaze at the mantle.

With the no-drip condensation burner the makers claim they avoid, and take care of all condensation that reaches the lamp.



No. 157 Burner.

It is claimed that, as it is impossible for any dripping on account of the peculiar shape of the burner, the mantle hangs from the gas tips, which are horizontally opposite each other.

The makers state that this lamp may be used on any make of tube lighting systems.

IMPROVED FILE-HANDLE.

The illustration shows a patent file-handle, which is manufactured by the W. T. Nicholson & Clipper Co., King Street, Salford, Manchester. As will be seen, the handle is provided with a

flanged steel tube, which is pressed into the wood at the end, and into which the file is driven. The flange of the tube overlaps the ferrule, which is formed with an internal turnover at the outer end. The tube flange is tapered in order to fit snugly over the ferrule, the whole making a very neat arrangement. The use of the tube prevents any splitting of the wood when the file is driven in, and also prevents the ferrule from coming off. There is thus no danger of the tang running into a workman's hand. The tube also serves a second purpose by so compressing the wood that the file is held much tighter than in an ordinary handle. This leads to an increased life for the handles, since they are not flattened on the end and destroyed by constant hammering.

STEVENS LINE LEVEL.

Frank. E. Corey, Newton Falls, Ohio, is offering the trade the "Stevens Line Level" here illustrated. The level, which weighs ½ ounce, consists of an accurate, proved level glass placed in a three inch aluminum tube with "spring German silver" end pieces and hooks formed from one piece of metal. The end pieces are attached to the tube by German silver rivets that pass through the tube and through lugs at top and bottom between the hooks and the centre of the level, thus preventing the hooks from pulling out of alignment in case of severe strain or rough usage.

The level can be carried in the vest pocket and the makers claim the levels can be used for ditching, sewerage, laying drain tile, stone, brick and cement walls, carpenter work, grading of all kinds, for use in mines and in erecting shafting and setting machinery.

By placing the level on the line at the centre where the deflection is equal towards both ends, the end points can be brought absolutely level regardless of how taut the line may be pulled. This method is advised in laying out foundations, proving walls, lining up shafting hangers and machinery and on all work where great accuracy is desired. For sewerage, laying drain tile, irrigation ditches and electrical conduits, where the grade is laid out in short sections, the level can be used near the end of the line, the fall estimated for five or ten-foot sections, the line leveled and the grade estimated by measuring below the line with a rule at the end of each section. The accuracy of this method will depend on how taut the line is pulled.

QUESTION BOX CONTINUED.

EDITOR Sanitary Engineer. — "I have read with great interest your articles on the developing of tin-shop patterns. Could you please show how to develop a pattern for a square mitre of an eavetrough, also a simple way to make tubes to use on eavetroughs?" Yours truly,

Inquirer.

Complying with inquirer's request we herewith show the proper way to develop eavetrough or gutter patterns, while our inquirer did not state in his request whether it was an inside or outside mitre pattern he required, we herewith show how both may be developed.

In Fig. A1 is shown a perspective view of an outside mitre. In Fig. B2 will be seen the perspective of an outside mitre.

We will now proceed with the developing of the pattern. First draw an elevation plan and size of eavetrough required as shown in Fig. C. It may be

here stated that while the trough we are showing is a simple half round one, it does not matter what style or size is required, the same method is adopted.

When plan as shown in Fig. C. has been drawn erect vertical line B.D. being the total length of material required, then draw horizontal lines A, B, C, D, these being long enough to make the two pieces of the mitre if new material off large pieces is being used up, but if small pieces are to be used any size large enough.

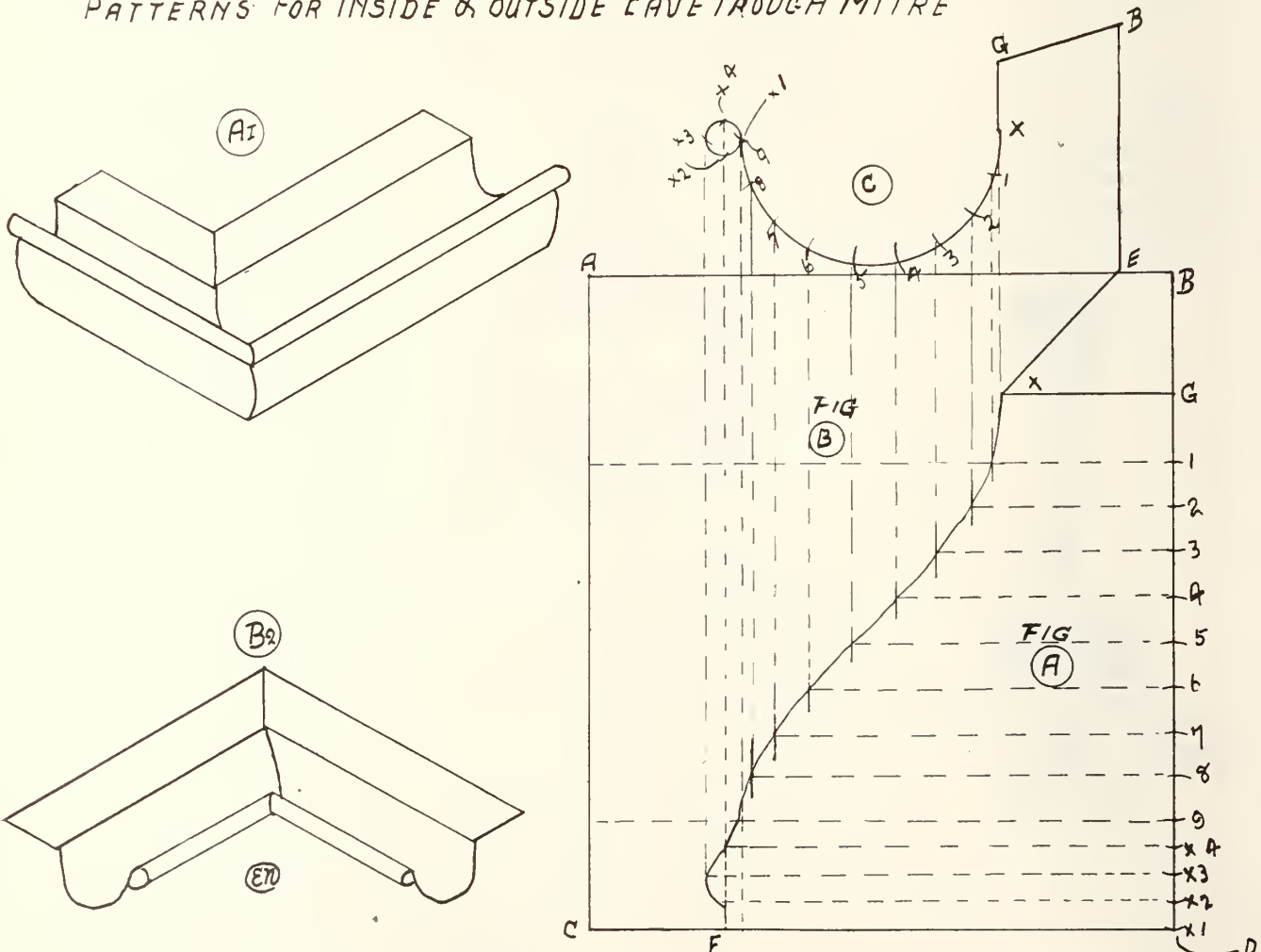
Having drawn lines A, B, C, D, forming almost a square as shown, proceed by spacing off pattern as shown in Fig. C., viz:—B, G, x 1, 2, 3, 4, 5, 6, 7, 8, 9, x1, x2, x3 x4. These spaces being necessary to form the stretchout, transfer these spaces to vertical line B, D, as shown, then erect lines as shown from x. 1, 2, 3, etc., in Fig. C. Next draw horizontal lines, G, x, 1, 2, 3, 4, 5, etc., so as to intersect the various vertical lines of the same numbers. Then

draw line as shown where these vertical and horizontal lines meet or intersect as shown this being the pattern. The portion marked Fig. A being pattern for outside pattern as shown in plan A1. If the eavetrough happens to be one of the same style as shown, viz., a true half circle, the portion marked Fig. B will be pattern.

Before concluding this answer to inquirer let us here mention that in a shop where a large amount of eavetrough work is done, a great deal of scrap may be used up in making these mitres, and the work is interesting to the apprentices.

It is of course well known that these mitres can be bought very cheap, but we must consider that the time on such jobs is well spent and to the lad in the shop learning his trade, the employer has a duty to perform. He will reap a greater benefit in the end than the actual cash value saved in buying these ready made.

PATTERNS FOR INSIDE & OUTSIDE EAVETROUGH MITRE



NEW CANADIAN PATENTS

No. 150,790.

Joseph Lafrance, Montreal, Quebec, Canada, 30th September, 1913; 6 years. Filed 5th May, 1913. Receipt No. 224,042.

Claim.—In a bowl connection means, a soil pipe fitting in the form of an outlet pipe having a pair of upwardly extending integral flanges at its open upper end forming an annular channel sectioned recess which is filled by the flooring and also having a short inwardly extending stop flange a short distance from its upper end, a bowl having a floor

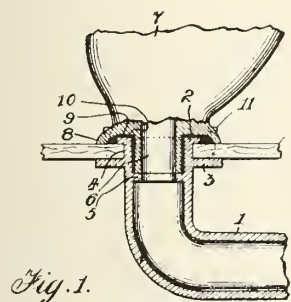


Fig. 1.

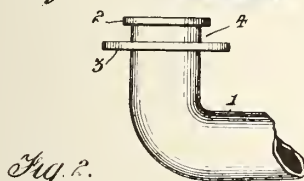


Fig. 2.

No. 150,790.

Bowl Connection.

flange with a recess in its under side completely and freely enclosing the uppermost one of said pair of flanges and also having a downward tubular extension freely depending within the upper end of said fitting and reaching to said stop flange, packing material encircling said extension and completely filling said bowl recess on all sides of said top flange, and means for securing said floor flange to the flooring.

No. 150,810.

Roderick J. Morrison, Caledonia Mines, Nova Scotia, Canada, 30th September, 1913; 6 years. Filed 26th June, 1913. Receipt No. 226,153.

Claim.—1. A wrench of the character described comprising a shank provided with a fixed jaw, a rack on said shank, a jaw slidably mounted on said shank, a plate connected to said slidable jaw, a gear wheel journaled in said plate and engaging said rack, and means for locking said gear wheel against reverse rotation.

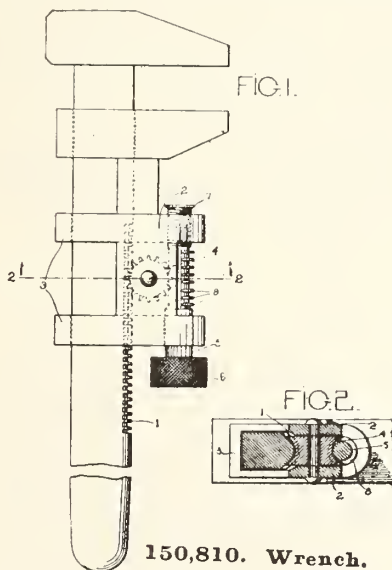
2. A wrench of the character described comprising a shank provided with a fixed jaw, a rack on said shank, a jaw slidably mounted on said shank, a plate

connected to said slidable jaw, a gear wheel journaled in said plate and engaging said rack, means for locking said gear wheel against reverse rotation, and means for tightening the grip of the slidable jaw.

3. A wrench of the character described comprising a shank provided with a fixed jaw, a rack on said shank, a jaw slidably mounted on said shank, a plate connected to said slidable jaw, a gear wheel journaled in said plate and engaging said rack, and means for simultaneously locking said gear against rotation and tightening the grip of the slidable jaw.

4. A wrench of the character described comprising a shank provided with a fixed jaw, a rack on said shank, a jaw slidably mounted on said shank, a plate connected to said slidable jaw, a gear wheel journaled in said plate and engaging said rack, a rod rotatable in said plate and provided with ribs to engage the teeth of said gear, and means for moving said rod longitudinally.

5. A wrench of the character described comprising a shank provided with a fixed jaw, a rack on said shank, a jaw slidably mounted on said shank, a plate connected to said slidable jaw, a gear wheel journaled in said plate and engaging said rack, a rod rotatable in said plate and provided with ribs to engage the teeth of said gear, and means



150,810. Wrench.

for moving said rod longitudinally during its rotation.

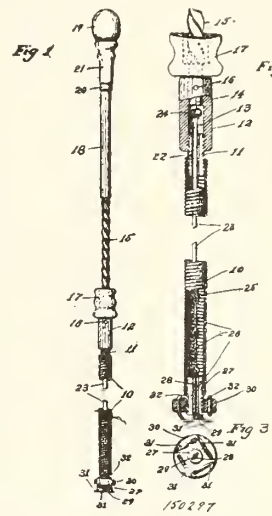
6. A wrench of the character described comprising a shank provided with a fixed jaw, a rack on said shank, a jaw slidably mounted on said shank, a plate connected to said slidable jaw,

a gear wheel journaled in said plate and engaging said rack, a rod threaded longitudinally into said plate, and ribs on said rod.

* * *

No. 150,297.

Jacob H. Levin, co-inventor and assignee of John A. Morrison, both of Minneapolis, Minnesota, U.S.A., 9th September, 1913; 6 years. Filed 20th March, 1913. Receipt No. 222,082.



No. 150,297. Device
for Removing
Obstructions

Claim.—1. A device for removing obstructions from passageways in plumbing comprising an extended flexible member, a hooked head secured to the flexible member, a handle, a tension member extending from the handle to the head, and means for rotating the head.

2. A device for removing obstructions from passageways in plumbing comprising an extended flexible member, a hooked head secured to the flexible member, a handle, a tension member formed of a flat steel ribbon extending from the handle to the head, and means for rotating the head.

3. A device for removing obstructions from passageways in plumbing comprising an extended flexible member, a hooked head secured to one end of the flexible member, a handle secured to the other end of the flexible member, a tension member, means securing the tension member to the head and the handle when said head and handle are caused to be moved in opposite directions, said securing means permitting relative longitudinal movement of the tension member and the flexible member, and means for rotating the head.

4. A device for removing obstructions from passageways in plumbing compris-

ing an extended flexible member, a hooked head secured to one end of the flexible member, a handle secured to the other end of the flexible member, said handle being formed with an interior cavity and an aperture leading therefrom, a flat steel ribbon extending through said aperture and having an enlarged portion within the cavity, the other end of said ribbon being connected with the head, and means to rotate the head.

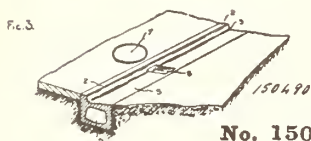
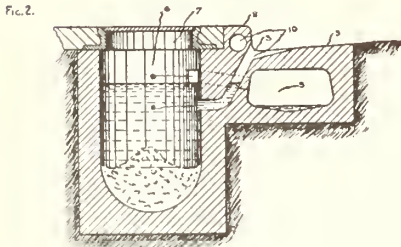
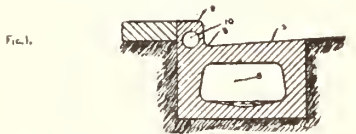
* * *

No. 150,490.

David W. Johnston, Kerisdale, British Columbia, Canada, 16th September, 1913; 6 years. Filed 6th February, 1913. Receipt No. 220,076.

Claim.—1. The combination with a road curb and gutter of concrete, of a surface water sewer beneath the gutter and integral therewith, the structure having ducts at intervals delivering from the gutter into the surface water sewer.

2. The combination with a road curb and gutter of concrete, of a surface water sewer beneath the gutter and integral therewith, the structure having ducts for delivering the water from the gutter at intervals to the main sewer, and separated ducts in the same structure for telephone wires or the like.

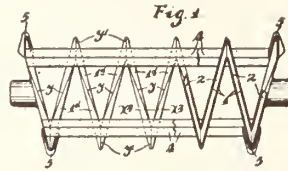
**No. 150,490.****Surface Water Sewer and Gutter.**

3. The combination with a road curb and gutter of concrete, of a surface water sewer beneath the gutter and integral therewith, and means at intervals for delivering the water from the gutter to the surface water sewer through a water sealed duct.

4. The combination with a road curb and gutter, of a surface water sewer beneath the gutter and integral therewith, a settling basin adjacent to the sewer, an inclined duct from the gutter to the catch basin, and an overflow duct from

the catch basin to the sewer, said overflow duct being above the inlet of the duct from the gutter.

5. The combination with a road curb and gutter of concrete, of a surface water sewer beneath the gutter and forming a part of the same construction, a catch basin adjacent to the sewer, an

**No. 150,436.****Hot Water and Steam Radiator.**

inclined duct from the gutter delivering into the catch basin, said duct being out of axial alignment with the basin, and an overflow duct from the catch basin to the sewer, said overflow being above the level of the inlet.

6. The combination with a road curb and gutter of concrete, of a surface water sewer beneath the gutter and forming a part of the same construction, a catch basin adjacent to the sewer, an inclined duct from the gutter delivering into the catch basin, said duct being substantially horizontal at its delivery into the basin and out of axial alignment therewith and an overflow duct from the catch basin to the sewer, said overflow being above the level of the inlet.

No. 150,436.

* * *

George C. Andrews, Minneapolis, Minnesota, co-inventor and assignee of Edward H. Williams, Aurora, Illinois, both in the U.S.A., 16th September, 1913; 6 years. Filed 23rd April, 1913. Receipt No. 223,590.

Claim.—1. A radiator made up of laterally spaced sheet metal plates alternately bent so that the folds thereof are approximately V-shape in cross section, the said plates being interlapped and spaced apart to form a zigzag chamber for the heating medium, and the upper and lower extremities or ends of the plates being formed with obliquely bent triangular portions, the edges of the tri-

angular portions of the two plates being united by steam tight joints.

2. A radiator made up of laterally spaced sheet metal plates, alternately bent, so that the folds thereof are approximately V-shape in cross section, the said plates being interlapped and spaced apart to form a zigzag chamber for the heating medium, the vertical end edges of said plates being brought together and connected by welded joints, the upper and lower edges of the plates are notched with V-shape notches at alternate lines of bending of the plates into folds, the metal between the point of the notch and the other alternate line of bending 1b between two notches is bent on a line from the point of said notch to the intersection of a line of bending 1b with the edge of the metal sheet, to form an oblique triangle, and the edges of the said oblique triangles of the two plates being brought together and united by welded joints.

3. A radiator made up laterally spaced sheet metal plates, alternately bent, so that the folds thereof are approximately V-shape in cross section, the said plates being interlapped and spaced apart to form a zigzag chamber for the heating medium, and the upper and lower edges of the plates are notched with V-shape notches at alternate lines of bending of the plates into folds, the metal between the point of the notch and the other alternate line of bending 1b between two notches is bent on a line from the point of said notch to the intersection of line of bending 1b with the edge of the metal sheet, to form an oblique triangle, and the edges of the said oblique triangles of the two plates being brought together and united by welded joints.

**A CREDITABLE MOVE IN MONTREAL.**

Dr. S. Boucher will present a report to the controllers shortly recommending a complete reorganization of the Health Department. Dr. Boucher also announced his intention to give the inspectors of his department a course in public hygiene and to establish a library at the City Hall, where the inspectors will be able to get a technical knowledge, which he considers to be necessary to properly fulfill their duties. "Every day I receive a considerable number of applications for positions of sanitary inspectors," said Dr. Boucher, "the majority being from men who have not the least knowledge of the work they are called to do. In the future I want inspectors who are fully qualified, and I intend to give them every opportunity to obtain a more complete knowledge of the work of inspection by means of lectures and books."

Keeping Record of Costs in the Tinshop

Paper Read by C. W. Conn, 1st Vice-President Ontario Retail Hardware Stove Dealers' Association at the Ottawa Convention
—Description of Special Forms Used.

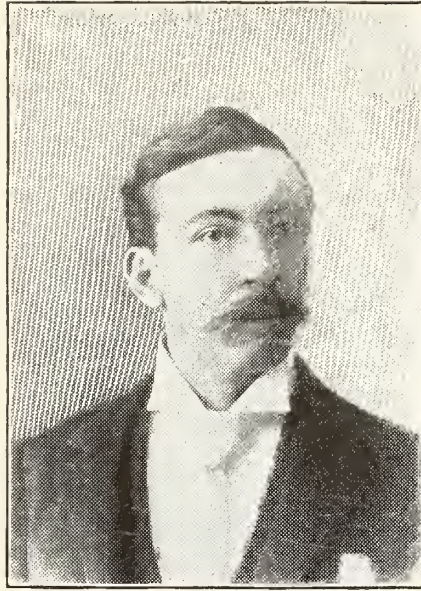
MR. PRESIDENT, officers and members of the Ontario Retail Hardware and Stove Dealers' Association:

Having been asked to give a few remarks on keeping track of costs in the workshop, I will give you an outline of my own personal experience along this line and trust it may be of some benefit to some of our members who have been in the habit of guessing at the cost of the work done and after a number of years in business wonder why they have not made a good profit.

Every one of us are in business to make money and in order to do so we must first determine the exact cost of work done on article made before making the price we are to receive for same. In the first place I have time-sheets (a sample of same I have here). You will notice they have the hours from 7 to 12 on one side and from 1 to 6 on the other side printed on same. Each man or apprentice must fill out his time card every day, accounting for every hour he works, also for material used. Their time sheets are turned into the office every night and the first thing I do in the morning is to check over these sheets and see that the work is charged up in its proper place; they are then placed in file in the office for future reference if occasion demands it.

For keeping track of small jobs or stock work I have had printed what I call a stock or job sheet (a sample of

which I have here). You will notice it has ample space to put down the material used for a small job, also has a space for each day's time to be put in. To



C. W. Conn, 1st Vice-President
O.R.H. & S.D.A.

better illustrate the working of this sheet, suppose I give an order to my man for four (4) dozen 12 qt. IX flaring pails to be made. When he starts this order, say at 10 o'clock Tuesday, he puts on his time card opposite 10 o'clock, "pails," which shows when he started

this job. He takes out his material as he needs it and marks same down on the stock sheet which he has started for this job. He works the balance of the day on this job and at six o'clock he puts down the hours he has worked on the pails (7), in the column provided for same on the stock sheet, and the next morning I take his time sheet and see that he has entered on the stock sheet the right time he has worked. Possibly he may be called away to do other work for one, two, or three days before he has a chance to work on these pails again; however, when he starts this job again, at the end of the day he puts down his time and material on the stock sheet and so on till the job is completed. When the sheet is turned into the office, and the material and time figured up you have the exact cost, no matter how long the job may be before it is completed.

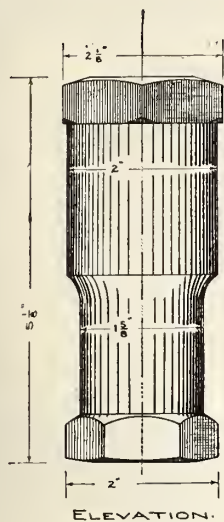
These sheets are then filed away for reference, and when you have this same job to do again, and you find there is a difference in the cost of same it gives you a chance to find out why this difference, also the men know you have these records and are more particular to be more accurate in keeping proper account of their jobs for they know you will notice it and want an explanation of same.

I can assure anyone who is running a workshop, no matter how many men he keeps, he must adopt a system of some kind to keep accurate account of mater-

(Continued on next page)

STOCK AND JOB SHEET					
ARTICLE OR JOB		DATE			
MECHANIC		PRICE		TIME	
	Material	Cost	Sell	Day	
				Mon	
				Tues	
				Wed	
				Thurs	
				Fri	
				Satur	
				Total hrs	
				Cost of Time	
TOTAL COST					
		Material			
		Time			
		Complete			
Total Price of Material					

TIME CARD		C. W. CONN	
NAME	DATE	191	
7	1		
8	2		
9	3		
10	4		
11	5		
12	6		



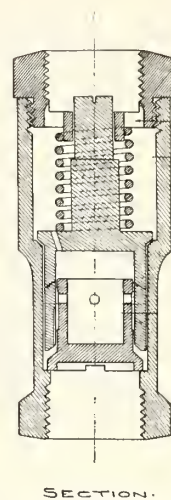
AVOID TROUBLE WITH Hot Water Heating Systems

Our Knickerbocker Automatic Regulator for Hot Water Systems, shown here both inside and out, is designed especially to overcome the one great objection to hot water heating, namely, low temperature of the radiation.

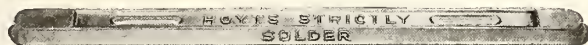
It does other things too. Among them may be mentioned: the ending of all trouble with old systems having sluggish circulation; reduces sizes of radiation and pipes on new jobs; makes a hot water system equal to a low pressure steam for flexibility, and better, by far, in the matter of temperature regulation.

If you want to know more about our Knickerbocker Regulator ask us for a circular. Ask for our catalogue of Brass Goods for Plumbers and Steamfitters at the same time.

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93-97 Adelaide Street West, Toronto



Our Mixed Metal Sales Amount to Over \$5,000,000 Annually



THE RESULT OF QUALITY

Babbitt Metal, Bar Solder, Wire Solder, Lead Pipe, Bar Lead, Traps, Bends, Copper, Tin and Antimony.

Let the goods prove their worthiness of a place in your stock. Send a trial order.

Hoyt Metal Co.,

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New York, N. Y.; London, Eng.; St. Louis, Mo.

John Wanamaker says that advertising doesn't jerk — it PULLS. He ought to know, and yet some men think that advertising should go against all rules and precedents and jerk them to success with one tremendous yank.

LEAD PIPE LEAD WASTE



BLOCK TIN PIPE

The Canada Metal Co., Ltd.,

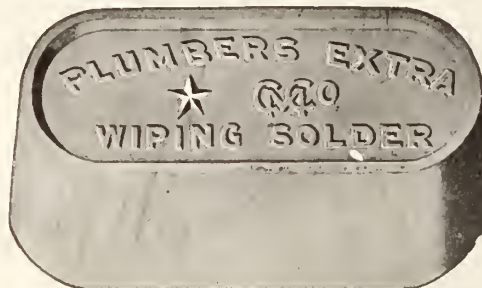
Head Office
and Factory,

TORONTO

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FOR THE PLUMBER

Lead Pipe Lead Waste
Hydraulic Drawn Traps
Non-Syphon Centrifugal Cast
Trap (Ask for Cut or Price).
Strictly Bar Solder
Star Extra Wiping (Best on
Earth)
Easy Wiping Solder
Acme Wiping
Brass Ferrules (Select) Tinned
Iron and Lead Combination
Ferrule Bends or Spun End Test
Sheet Lead Lead Fibre

PLUMBER'S EXTRA STAR WIPING SOLDER



THE SOLDER WITH THE TIN IN

Branch
Factories MONTREAL, WINNIPEG

Economy Automatic Condensation Pump and Receiver

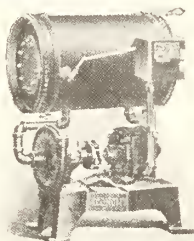


Fig. 2129.

An expansion tank, an automatic switch and a centrifugal pump automatically operated by an electric motor.

STIMULATES CIRCULATION by drawing condensation through system, venting the air and returning the water to the boiler at high temperature.

ELIMINATES SNAPPING and CRACKING in the radiators and pipes. A STIMULANT AND GOVERNOR to the entire system.

A great SAVER OF FUEL. Requires no attention other than an occasional oiling.

Operates equally well on high or low pressure systems.

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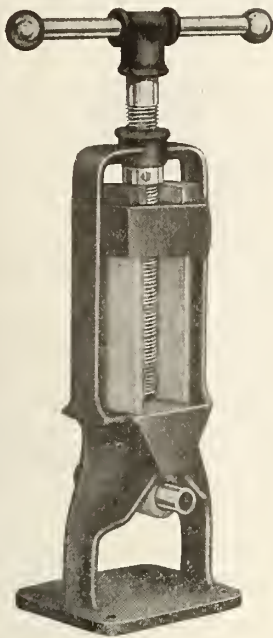
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The index is inserted solely for the convenience of the readers of the paper.

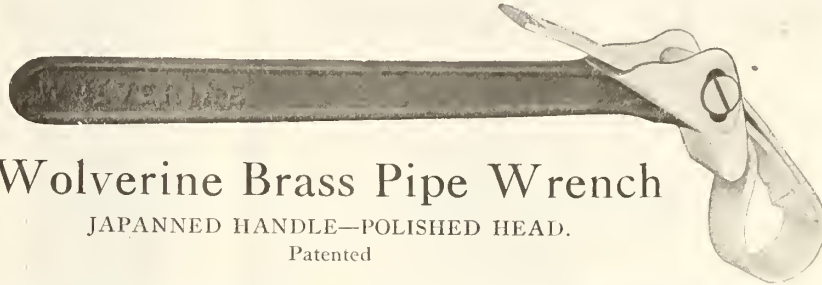
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CAPACITY 1/4-INCH
TO 2-INCH I.P. SIZEWolverine
Strap Vise

Every job done without a mar on the pipe
will increase your prestige



Wolverine Brass Pipe Wrench

JAPANNED HANDLE—POLISHED HEAD.
Patented

Wolverine Strap Vise holds large
or small pipe for threading, cut-
ting or screwing on fittings, etc.

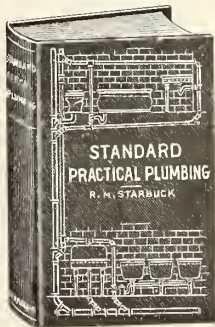
Will not mar the finest surface.
Strap is extra heavy and guaran-
teed to stand the strain and wear.

Wolverine Brass Pipe Wrench
has a patent locking device which
not only tightens with increased
strain, but will instantly release
strap when pressure is taken off.
Will not mar or crush pipe.

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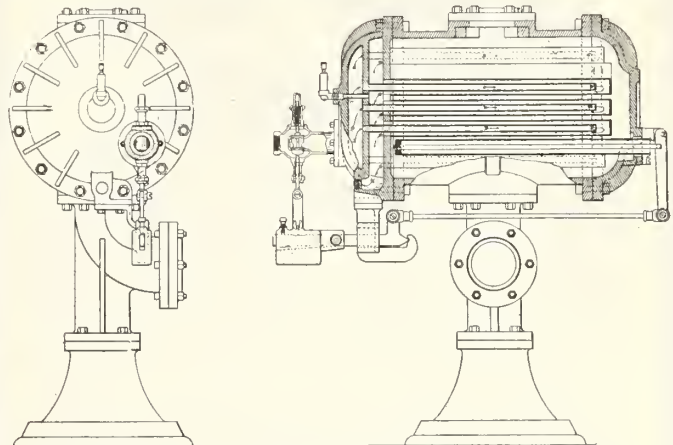
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Let us give you full particulars, regarding this newest and best method of heating. Write for descriptive catalog F.

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Customers like this are quickly landed when you show them the

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It sells for a moderate price, yet conforms to high quality standards. The tank and bowl are of fine vitreous china. All exposed parts are heavily nickel-plated. The tank is equipped with the J-M Dirigo Solderless Copper Float and Douglas Pattern Flushing Valve, while the bowl is fitted with the famous J-M Sanitor one-piece Seat.

Water surface of 75 sq. in., with 3-inch water seal. Instantaneous in action; gives a perfect flush; and is practically silent—a feature that your clients will appreciate.

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**THE CANADIAN
H. W. JOHNS-MANVILLE CO., LIMITED**

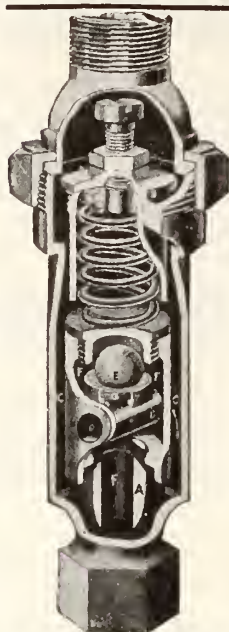
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B

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The maximum capacity of this valve is
3,000 Square Feet of Radiation

When the water contained in this amount of radiation is expanding to its limit—the spring compresses only

1-8 inch.

It cannot move further and this compression would not weaken it in a hundred years—who of us will be alive at the end of that time?

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carried in stock for immediate
shipment of

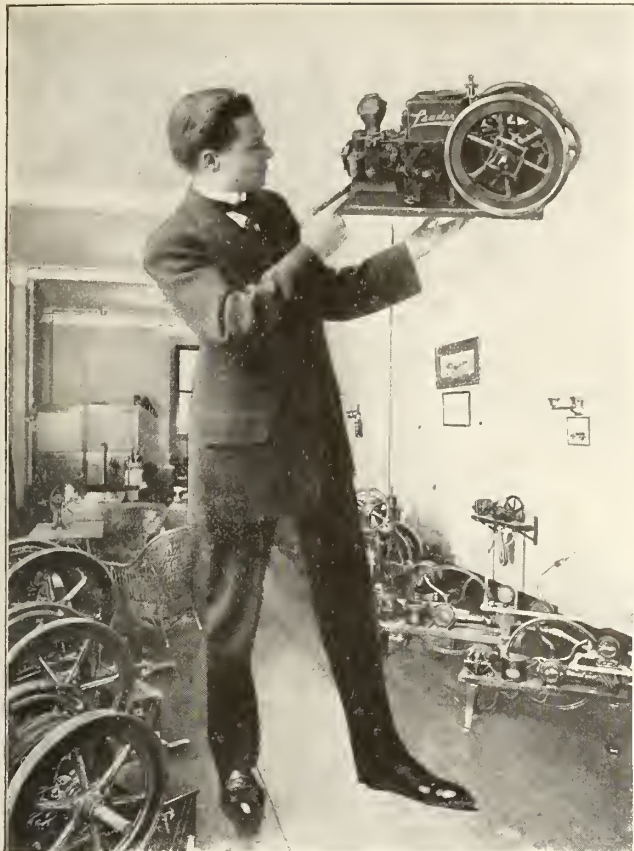
**Brass and Copper Pipe
Iron Pipe Size.**

Brass and Copper Tubing.

Brass and Copper Rod.

Brass and Copper Sheet.

Tallman Brass & Metal Co.
HAMILTON, ONT.



Above illustration taken from front cover of *Leaderite*, published monthly by Leader Iron Works.

WHAT BROWN SAYS—

Use one
sheet for
each
subject

Leader Iron Works NEW YORK
Inter-Office Correspondence

To Decatur.

Date Jan. 17, 1914.

Subject: Fig. 300 Pumper.

Attention of Mr. O'Brien.

Answering yours of the 15th inst., inquiring of the general impression Fig. 300 Gasoline Pumper has made on visitors to the office.

Would say in my ten years' experience in selling pumping machinery I find less salesmanship is required to sell Fig. 300, and more pleased customers after it has been sold, than with any piece of machinery which I have handled.

I do not think of any improvement other than to make more pumps, for, as you know, we were short all last season.

Yours truly,

LEADER IRON WORKS.

Per S. A. BROWN,
Resident Manager.

SAB-M

Use one
sheet for
each
subject

Leader Iron Works DECATUR
Inter-Office Correspondence

To New York.

Date Jan. 19th, 1914.

Subject: Fig. 300 Pumper.

Attention of Mr. S. A. Brown.

Replying to your letter of January 17th.

We believe we have anticipated the coming demand for Fig. 300 Pumps in arranging to take care of three times last year's sales, and you may inform those who call at the office accordingly.

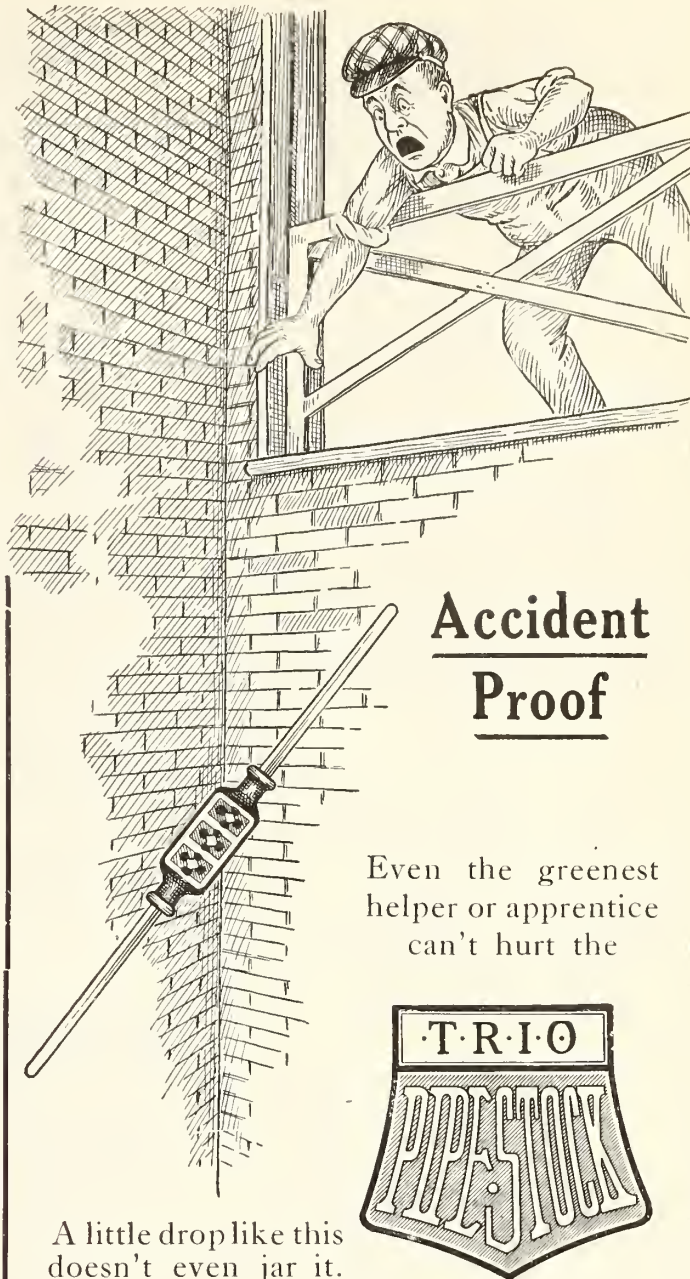
We are glad to note your trade is pleased with the design and operation of this rig, and believe this information will be of interest to the trade generally.

Yours truly,

LEADER IRON WORKS.

By T. E. O'BRIEN,
V. P. & Mgr.

TEOB-G



A little drop like this
doesn't even jar it.

Built to last forever

Equal to any three ordin-
ary pipe stocks.

Sold at the price of one.

Always ready to cut 3 sizes.

MANUFACTURED BY

Canadian Tap & Die Company
Galt, Ontario

STUDY

These Uncrowded Professions

Sanitary Science and Engineering, Sanitary Inspectorship, The Science of Plumbing, Hygiene, under the directorship of Prof. Arthur Bateman, M. Inst. S.E., A. R. San. I., M. I. P., R. P. C., Eng

SUCCESS GUARANTEED.

Write for free booklet.

Desk 3

Anglo-American Sanitary Correspondence College, 10-12 W. Ontario St., Chicago, Ill.

SYPHONS FOR SEPTIC TANKS

Alex. I. Mearns

93 St. Genevieve Street, Montreal

READERS

The Editor wishes every one interested in
**Domestic Sanitary
Heating and
Ventilating
Engineering**

to make use of this paper. Any article or problem of interest, any topic of note will be used if any such has a tendency to uplift the Trade.

Every local or provincial association can use this paper free of charge to make other members acquainted with the business done and benefits derived from being an organized body.

Condensed or "Want" Ads.

FOR SALE

WILL SELL THE EXCLUSIVE RIGHTS OF handling the B-H Vapor Vacuum Specialties in Canada to reliable party. Address B-H Vapor Vacuum Heating Co., Emporia, Kansas.

FIRST-CLASS PLUMBING AND PUMP business in a town about 2,000, doing a good trade, water works just installed last summer and a good business is being done. An A1 business for a first-class plumber, stock about \$800.00. Good reasons for selling. Address Box 73, Fergus, Ont. (9)

CANADIAN PATENT AND UNITED STATES rights for same, covering valuable invention for steam radiator providing positive control, also connecting valve for sale. Cash or Royalty basis. Reasonable. Particulars, address Box 51, Sanitary Engineer, Toronto. (5)

FIRST-CLASS PLUMBING AND PUMP business in a town about 2,000, doing a good trade, water works just installed last summer and a good business is being done. An A1 business for a first-class plumber, stock about \$800.00. Good reasons for selling. Address Box 73, Fergus, Ont. (4tf)

SECRETARY WANTED

APPLICATIONS WILL BE RECEIVED FOR the position of secretary for the Ontario Society of Domestic Sanitary and Heating Engineers. A middle-aged, clerical person preferred. Box 76, Sanitary Engineer, Toronto.

When writing advertisers, kindly mention having seen the ad. in this paper.



GENUINE ARMSTRONG STOCKS and DIES

FOR THREADING PIPE OR BOLTS

KNOWN, USED,
COMMENDED EVERYWHERE

PIPE MACHINES,

both Hand or Power

HINGED PIPE VISES

PIPE CUTTERS

PIPE WRENCHES

RATCHET ATTACHMENTS

BARD ADJUSTABLE
BUSHINGS

Manufactured by

**THE ARMSTRONG M'F'G.
CO.**

317 Knowlton St.

BRIDGEPORT, CONN., U.S.A.
NEW YORK CHICAGO

WRITE FOR CATALOG

"Agrippa"

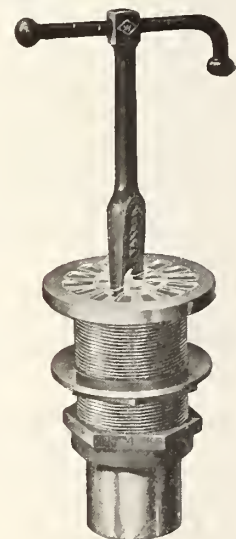
Chain Wrenches



Universal for Pipe and Fittings

A life may depend upon or an injury may result from the use of most tools. "AGRIPPA" Chain Pipe Wrenches are tested and proved dependable before they reach you. This practice is unknown elsewhere—every weakness is eliminated.

"AGRIPPA" Wrenches will do all of your pipe and fittings work and are guaranteed to do it without a failure—and at the minimum of cost.



Show us a plug which a Williams Waste Plug Spanner will not fit.

J.H. Williams & Co.

Superior Drop-forged Tools

77 Richards St., Brooklyn, N.Y. City
40 So. Clinton St., Chicago, Ill.

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The New MUELLER No. 4 Regulator Catalog



D-13160

is now off the press and yours for the asking.
Every Plumber should have one.

MUELLER Regulators are known and acknowledged by plumbers as the greatest regulators for efficiency and accuracy. Under the greatest extremes and most exacting service MUELLER Valves will give perfect service.

MAIL US THE COUPON BELOW TO-DAY

This catalog represents the most comprehensive and adaptable line of regulators and strainers on the market. Included are valves for water, steam, gas, air, oil, ammonia, acetylene, oxygen, —in fact a regulator for every pressure.

All Mueller Goods are Unconditionally Guaranteed.

This insures you quality in workmanship, materials, and designs.

"MADE IN CANADA"

H. Mueller Mfg. Co. Ltd.
SARNIA, ONTARIO

S.E.

**H. Mueller
Mfg. Co. Ltd.
SARNIA, ONT.**

Gentlemen:—

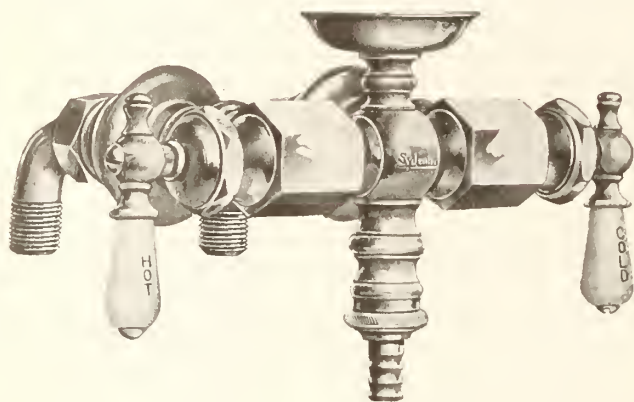
Please send your new Regulator
Catalog No. 4 to

Name

Address

Ask Your Jobber for this SYDENHAM BATH COCK

It's New—It's Different
It's Better



Quick-opening compression style with full half-inch capacity throughout.

Heavy construction, massive in appearance.

Flexible cotton seat washers. Flanges have three-eighth of an inch adjustment without showing threads on stud.

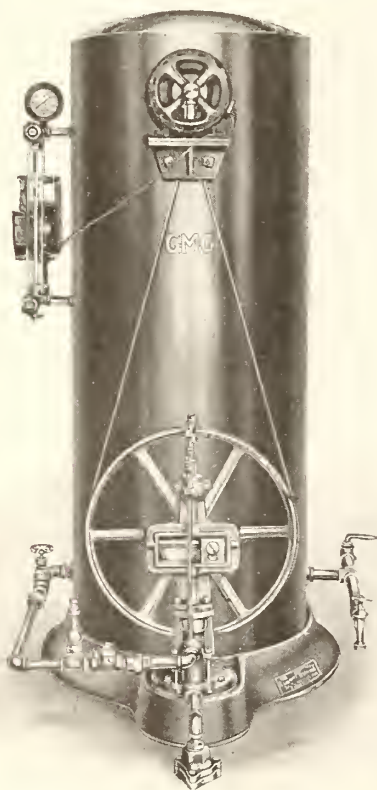
Made with Porcelain or Metal Handles, with and without Jewel Tray.

THE WALLACEBURG BRASS & IRON MANUFACTURING CO., LIMITED
WALLACEBURG, ONTARIO.

Toronto,
L. N. Vanstone,
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G. M. C. Water Systems

The "G.M.C. Special" No. 21

Absolutely the best value ever offered in an Automatic Electric Water System.

Complete in every detail.
Two sizes, 120 and 220 Gal.

These systems are furnished complete as shown—Shipped knocked-down—Can be installed by a competent man in one hour.

One Sale Means Many

The General Machinery Co., Ltd.,

22 Mulock Avenue, Toronto

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THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

DART UNIONS



The Pipe Couplings that are trouble-proof

Both Sections are seated with Non-Corroding BRONZE, machined and ground to a true BALL Joint.

Can be connected time after time without impairing their efficiency. Are never affected by expansion, contraction, vibration or corrosion.

Manufactured by DART UNION CO., Limited, Toronto

Jobbers from coast to coast sell them.



This is The Radiator Valve You Have Been Waiting For



An absolutely PACKLESS valve, with no composition rubber rings or discs in the bonnet to take the place of packing.

An all metal valve with accurately ground cone joint in bonnet, which will not score, cut or become unevenly worn, as the spindle bearing runs the length of the bonnet spindle cavity.

No strain on the stem or stem seat at any time other than the tension of the phosphor non-corrodible spring which holds it in its place.

All the thrust is against the threads on the disc carrier and in the heavy bonnet. The stem simply acts as a KEY to revolve the disc carrier. No inexperienced person can tamper with the working parts of this valve, as they are all

securely locked inside the valve.

Every valve tested with steam, and we guarantee them to be tight.

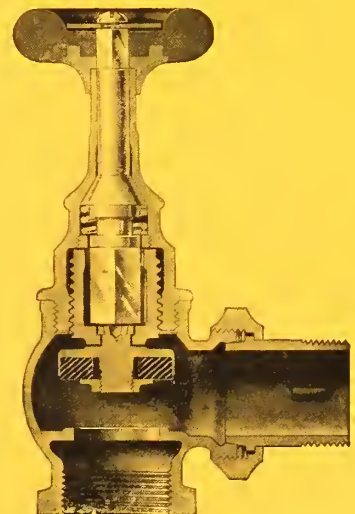
Give this valve a trial on the next vacuum job or high class steam heating plant.

The Kerr Engine Company, Limited,

Valve Manufacturers,

WALKERVILLE,

ONTARIO



TRADE MARK
GALT BRASS

Overflow Tube
Telescopes

Waste Tube
Telescopes



No Time Lost
Connecting
THE
"ADJUSTO"

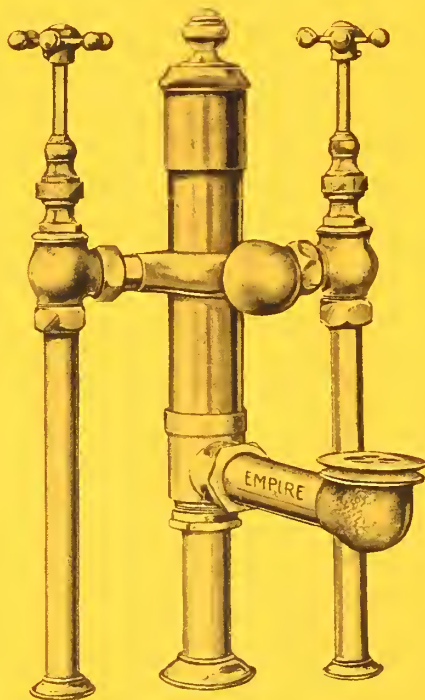
Cast Brass Strainer

Cast Brass Waste Plug

Cast Brass
Coupling Nuts

Manufactured
only by

GALT BRASS CO., Limited, GALT,
CANADA



Sitz Bath Set of Bell Supplies and
Waste

The Figuring of time is al-
ways the Sticker on any job

On any large contracts there is always an allow-
ance made for unforeseen troubles over and above
the possible minimum time.

If you want to minimize this item and add it to
your profits use

EMPIRE PLUMBING GOODS

All our fittings are made to standards and thor-
oughly tested and inspected before leaving the
factory and are guaranteed to fit exactly the fix-
tures they are intended for.

If you have not used them, specify them in your
next order, if you have, we know you will continue
to use them.

Empire Mfg. Co., Ltd.

Head Office and Factory, LONDON, Ont.
Montreal Office, Room 31, C. P. R. Telegraph Bldg.,
Winnipeg Office, 109 Carlton Block, Portage Ave.

THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 701-702 Eastern Townships Bank Bldg.
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TORONTO, 143-149 University Ave.
CHICAGO, 140 S. Dearborn St.

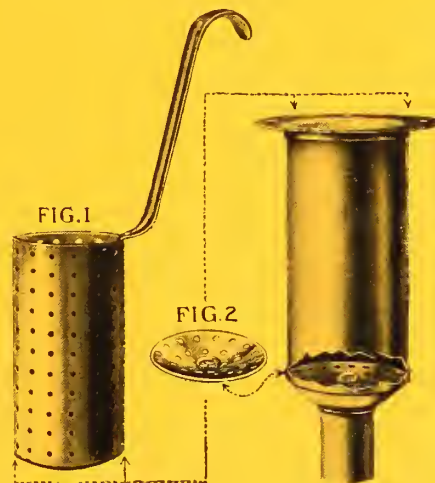
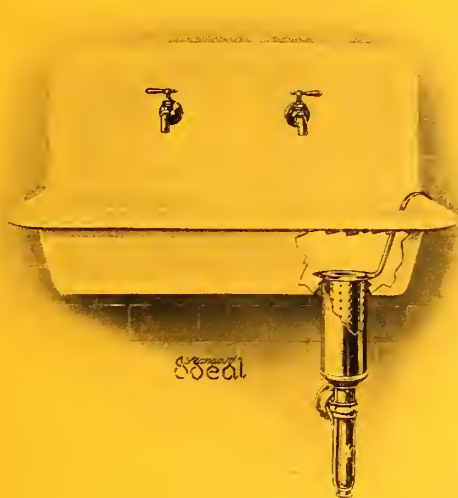
WINNIPEG, 34 Royal Bank Building
NEW YORK, 115 Broadway

Vol. VIII.

Publication Office : TORONTO, MARCH 16, 1914

No. 6

Standard Ideal "SANISTRAINER" - PATENTED -



F-321—18x30 Roll Rim Sink supported on Concealed Hangers, and with Sanistrainer.

LIST PRICE \$14.50

Fuller Bibbs and 1½-inch P Trap as shown, \$5.75 extra. Additional Patterns in preparation.

The Sanistrainer represents the most notable advance made in the improvement of Sink Strainers during recent years, and meets the demand for a Strainer that not only strains but also **COLLECTS THE REFUSE OF THE SINK** in such a manner that it can be conveniently removed, without coming in contact with the hands.

The combined Refuse Collector and Strainer (Fig. 1) may be conveniently lifted from the Sink for emptying and cleaning, and the liability of the Drain becoming clogged while the Strainer is removed is eliminated by a secondary Strainer Plate, as shown in Illustration (Fig. 2).

The Sanitary and Convenient Features of the Sanistrainer should appeal instantly to any Housewife, and if these are displayed in your Show Room, they should become ready and extensive sellers.

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

TORONTO
119 King St. East

MONTREAL
42-44 Beaver Hall Hill

WINNIPEG
76-82 Lombard St.

VANCOUVER
410 Carter Cotton Bldg.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

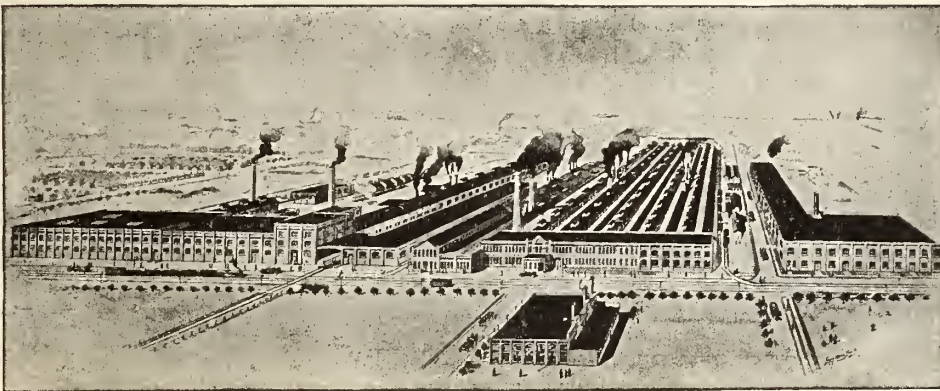
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AGENCIES:

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178 Victoria St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes,
120 Lombard St., Winnipeg

BRITISH COLUMBIA:
A. O. Campbell,
864 Cambie St., Vancouver



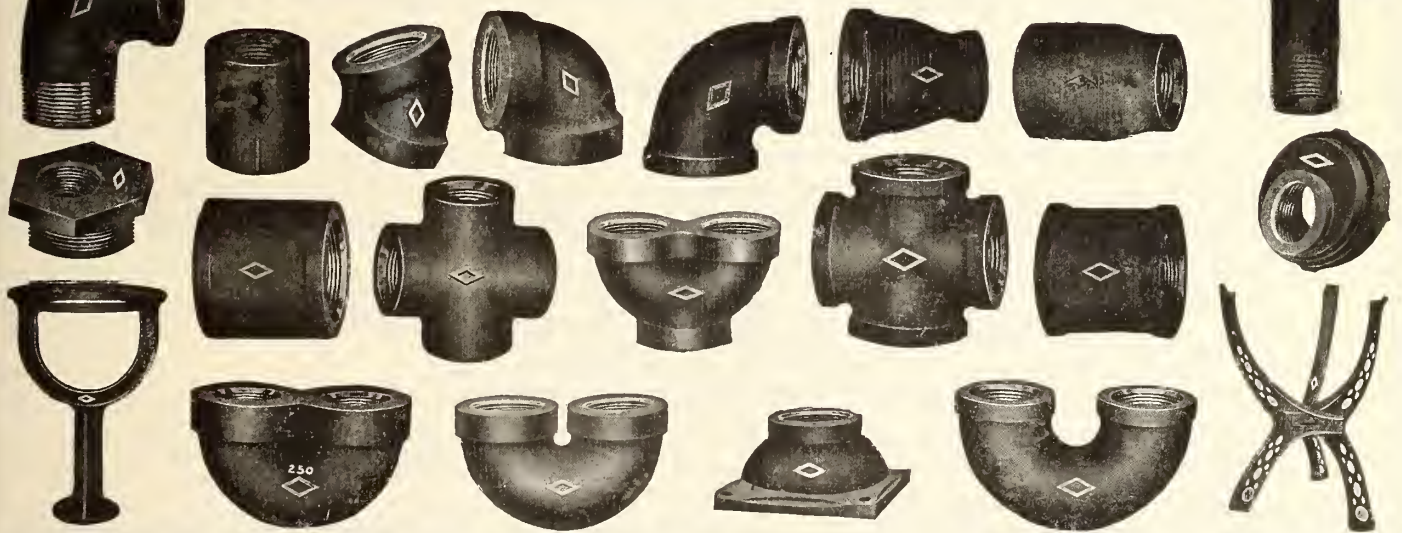
GENERAL OFFICES AND WORKS:

FITTINGS LIMITED, OSHAWA, CANADA

WAREHOUSES:

MONTREAL WINNIPEG VANCOUVER

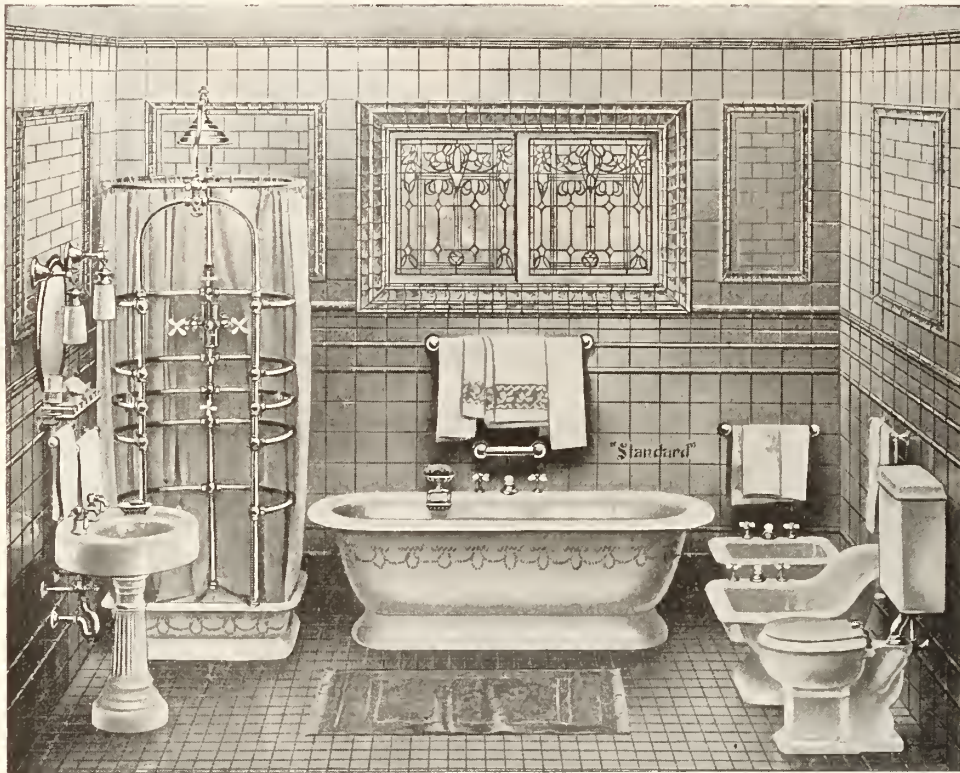
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"Standard Sanitary"

Plumbing Fixtures



"Standard Sanitary" Bathroom of Queen Victoria of Spain.

The above cut was made from a photograph of the fixtures actually installed in the Royal Palace of La Magdalena, Santander, Spain, the summer residence of their Majesties, the King and Queen of Spain.

A similar bathroom was also installed for the King, and eighteen other complete "Standard Sanitary" Bathrooms for the other members of the household.

This is an extremely practical and beautiful interior and combines with beauty and refinement every modern sanitary idea.

The fixtures are set into the tiling, thus offering no place for dust or moisture to collect, and reducing cleaning labor to a minimum.

The Foot, Sitz and Shower Baths make an unusually complete and artistic bathroom at a cost that is very reasonable, considering the quality of fixtures shown.

"Standard Sanitary" plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales-agents throughout the Dominion.

Standard Sanitary Mfg. Co., Limited

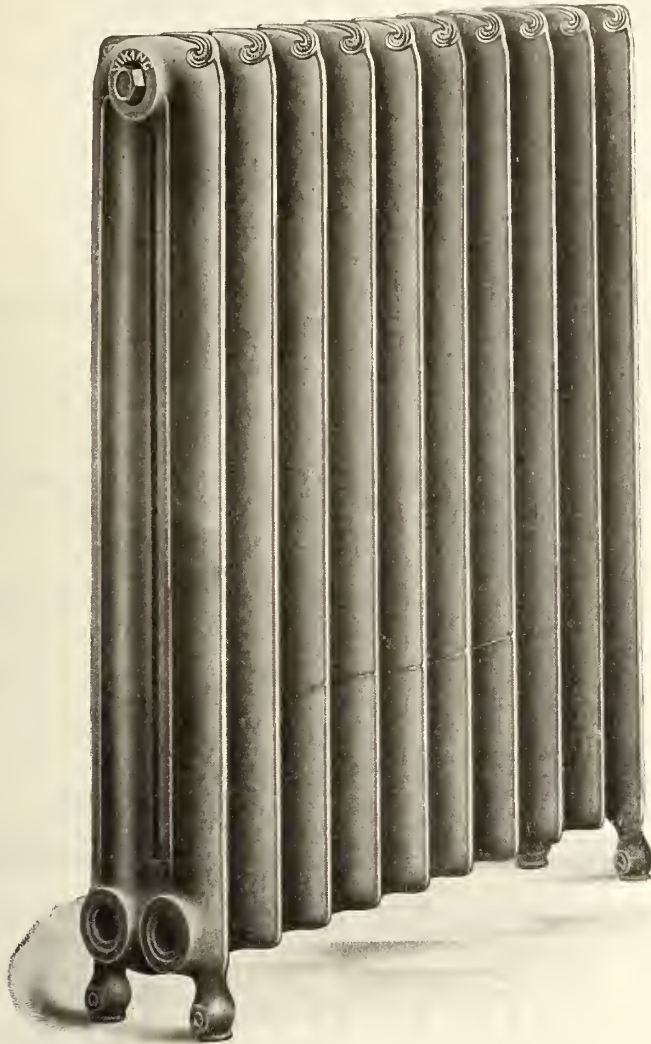
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ROYCE AND LANSDOWNE AVES., TORONTO, ONT.

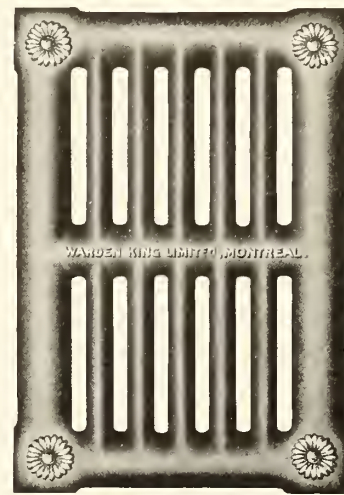
Toronto Store:
55-59 Richmond Street East.

Hamilton Store:
20-28 Jackson Street West.

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Just Out!
The New
“VIKING”
RADIATORS



These are the latest additions to our products, and are the neatest Radiators on the market to-day. They are fully described in our new Catalogue. Send for a copy at once.

We are the sole manufacturers of the celebrated “Daisy” Hot Water Boiler. Over 50,000 in use. This speaks for itself, and repair parts, if necessary, for any of the different styles, may be obtained at once.

WARDEN KING LIMITED, MONTREAL
Branch, 200 Adelaide St. West, TORONTO

**AGENTS
 IN
 CANADA**

The CRANE & ORDWAY CO., WINNIPEG, MAN.
 The MECHANICS' SUPPLY CO., Limited, QUEBEC, QUE.
 The JAMES ROBERTSON CO., Limited, ST. JOHN, N.B.
 The WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

DUNHAM

SYSTEMS OF HEATING

Before planning your next heating job just stop and think:—

OF the many inferior systems that came to grief last winter, due to freeze-ups.

OF the many complaints that came from noisy steam jobs with leaky air valves, requiring continuous adjustments.

And of many other systems that have proven unsatisfactory to your clients because of various shortcomings and complaints.

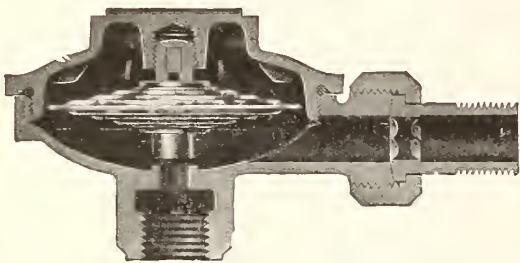
ALL of these "kicks" can be overcome by use of either:—

Dunham Vacuum System, Dunham Vacuo-Vapor System or Dunham Vapor System

One or other of these systems will fit the smallest bungalow or the largest office building or group of buildings, or any of the sizes in between.

These systems make use of the Dunham Radiator Trap on the return end of the radiator.

THE DUNHAM RADIATOR TRAP

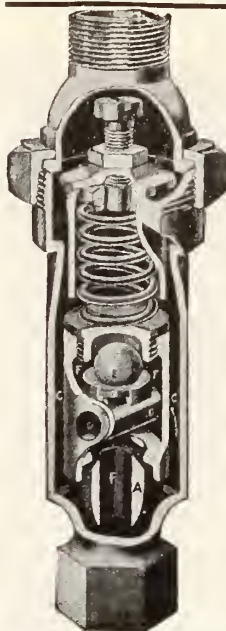


Performs the functions of a Radiator Steam Trap, perfectly and continuously. Eliminates water and air without loss of steam.

Write for new catalog and allow us to consult with you on your next job and help you to eliminate these complaints on all your future work.

C. A. DUNHAM CO., Ltd.
Toronto, Can.

Vancouver—520 Duncan Bldg.
Calgary—Metals Limited.
Winnipeg—405 Tribune Bldg.
Montreal—No. 24-11 St. Sacramento St.
Fort William—Plumbing & Engineering Supply Co.
Halifax—General Contractors Supply Co., 98 Granville St.



What about the
Spring in the

B

Heat Intensifier?

The maximum capacity of this valve is
3,000 Square Feet of Radiation

When the water contained in this amount of radiation is expanding to its limit—the spring compresses only

1-8 inch.

It cannot move further and this compression would not weaken it in a hundred years—who of us will be alive at the end of that time?

Use the Intensifier and also the "B" Pipe Joint Compound when installing it.

NATIONAL STEAM SPECIALTY CO.

24-26 Clinton St., Chicago
Surplus, Dunn & Co., 74 Murray St., New York
L. N. Vanstone, 8 Wellington St. East, Toronto
Moncrieff & Endress, Limited, Scott Bldg., Winnipeg

300,000 lbs.

carried in stock for immediate
shipment of

Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

Brass and Copper Rod.

Brass and Copper Sheet.

Tallman Brass & Metal Co.
HAMILTON, ONT.

SAFETY FIRST

A WARNING TO YOU



Note.—The tank in question blew up at 40 lbs. pressure, and nearly killed Mr. Currie.

Every Peerless Pneumatic Tank—no matter how small—is heavily riveted, caulked and tested in accordance with the best engineering practice—why risk your life or that of your customers?—Read the letter again, it's worth while.



D. J. CURRIE

RICHMOND ROAD

PNEUMATIC WATER SYSTEMS
A SPECIALTY

WESTBORO. Feb. 24 1914

The National Equipment Co.
Toronto, Ont.

Dear Sirs:

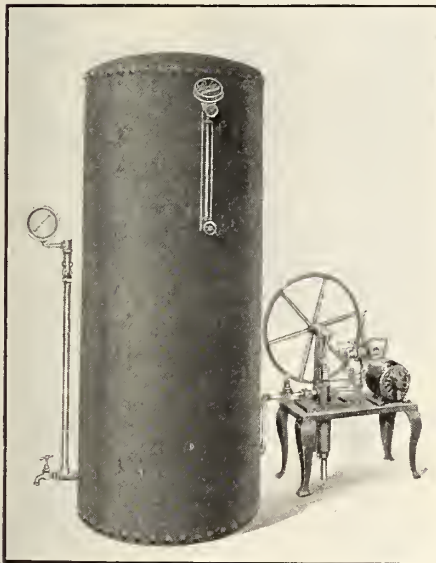
Replying to your inquiry regarding particulars of accident that occurred to me on January 5th, 1914, would say that tank which burst was one of which the seam had been welded by the Oxy Acetylene Process and was not a rivetted seam such as supplied by your Company.

I may add that all the outfits I have received from your firm are giving the best of satisfaction, and do not hesitate to recommend the tanks as a dependable construction.

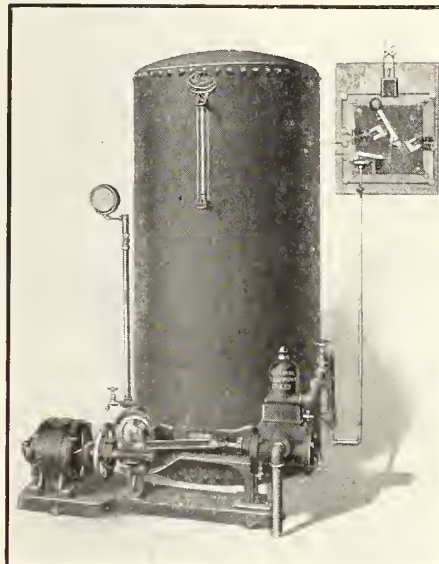
If I had not been prevailed upon to try the other construction, I have no doubt that the accident would never have occurred.

Yours very truly,

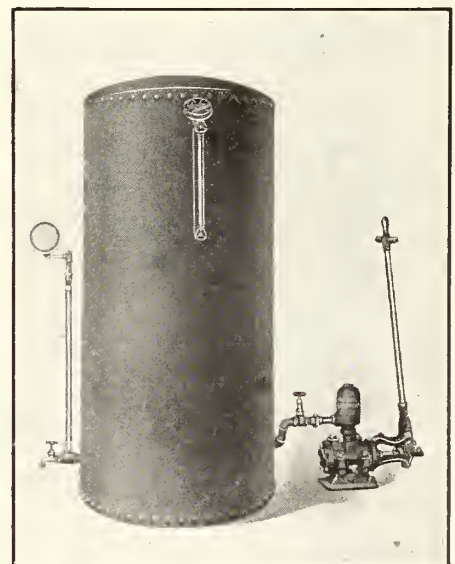
David J. Currie.



300 Series



400 Series



112-B

NATIONAL EQUIPMENT COMPANY, Limited
Wabash Ave., Toronto

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THE GURNEY-OXFORD Hot-Water Boiler

Most economical and efficient grate known.

Largest and most powerful first section over fire. Greatest capacity for a cold snap—for the addition of radiation—for the addition of a domestic heater.

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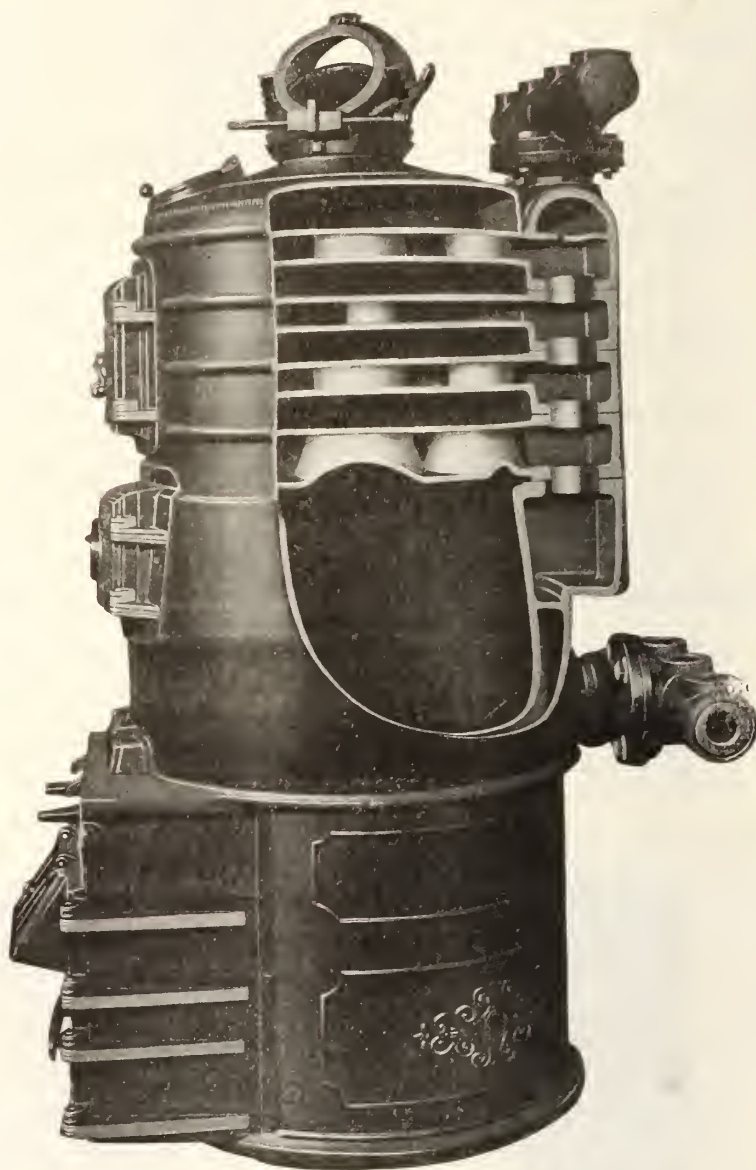
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Suitable for 125 pounds working Steam Pressure.



Fig. 401

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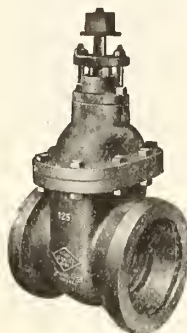


Fig. 400

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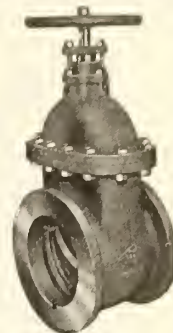


Fig. 402



Fig. 403



Fig. 404

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SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, MARCH 16, 1914

No. 6

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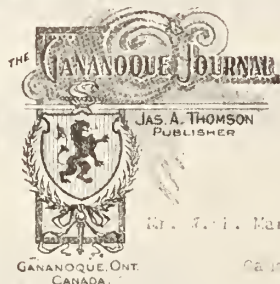
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Yours respectfully,

Jas. A. Thomson
Publisher "Journal."

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THE SANITARY ENGINEER

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Price Cutting, Its Cause and Effect

Showing Why Price-Cutting is Resorted to, its Evil Effect Upon Those Who Practise it and Those Who Seem to Benefit by it.

AT this season of the year when manufacturers and jobbers are bidding for new accounts and new orders, etc., when trade is not quite as brisk as they feel they would like it to be, an atmosphere of price-cutting seems to be prevalent. Both these classes of business men are complaining of this tendency which is in evidence just now, and which is much to be regretted. Now why should this suicidal practice be resorted to? In the first place we presume every manufacturer or jobber is aware of what it costs him to do business. He must know exactly what it costs to turn out the goods if he is a manufacturer; his foremen of various departments can tell him what each operation costs in labor; and he should know what his various machines cost to perform these operations. What then is the reason for this price-cutting? It is simply this, he begins to reason that if his sales can be increased to a certain amount, his overhead expense will be less per cent. when spread over the larger amount of sales, and in that way he is tempted to lower his price with the idea of increasing sales. Another matter for regret is the fact that there are a number of buyers who make a practice of stating they can buy goods from such and such a dealer or manufacturer for a price lower than that at which they really can buy, thus creating a feeling amongst the manufacturers and jobbers that price-cutting is in the air, when it is not. Now, why is this done? Here is a point to study. The moment a manufacturer or jobber lowers his price he at once admits to his customer that he was at first trying to get a higher price than he was prepared to take. He admits, in fact, that his price was too high, and the buyer, on getting such an impression is always on the lookout for a cutting of the first price quoted. If the lower price has been quoted and accepted, the manufacturer then begins to see where he can lower the quality of his goods to meet the price, and in plumbing goods this can be done in more ways than one, and in such a way that the buyer cannot detect the inferiority in quality. Thus, such methods

besides doing harm to the whole trade from a monetary standpoint, lower the standard of the goods which are being placed on the market, and demoralize the business character of the manufacturer. The latter loses pride in his products and the buyer loses respect for the manufacturer.

Let us just look around and see if any firm, who in the past has been proved guilty of price-cutting, is at present being called upon to supply good quality goods. Do the buyers of first-class goods ever think of these price-cutting jobbers or manufacturers? We venture to say, no!

Then on the other hand let us call to mind those manufacturers who have always stuck to their price. What standing do they hold in our estimation? Their fellow-manufacturers respect them, the buyers respect them and call invariably for their goods. Such is the result of making quality king and price right to enable the maintenance of quality.

The Buyer.

Now let us turn to the buyer, and see what effect the price-cutting evil has upon him. He is always on the lookout for a lower price, and not being at this date a competent judge of the various goods he buys, he must first install them and let time prove the actual quality of the goods; then again if the buyer is on the lookout for price-cutting, he, in ninety-nine cases out of one hundred, is a price-cutter himself, and, where does he stand amongst his competitors and customers? We know from past experience that if a customer wants a really high grade installation, he very seldom goes to the sanitary engineer who was ready to cut his own prices. No, he goes to a firm who is known to charge the biggest price and install the best grade of goods. Thus, he not only loses the customer, who wants a good job, but also loses that customer's respect. Price-cutting is the highest curse in all lines of business to-day, it cannot be termed competition, but it can justly be termed demoralization, because of its demoralizing effect on business.

One could understand a little temptation to cut prices in a country where

business is to a certain extent a given quantity, and where increase in business was not large, but here in Canada where demands are forever on the increase, where new companies are starting up to cope with that ever-increasing demand, we fail to see any sane reason for price-cutting, and it would delight us to see manufacturers take more pride in their products at the selling end, thus creating a better standing for their business, as well as giving it a higher character. In so doing they would extirpate the price-cutting evil, once and for all, on the part of the buyer and the seller.

No manufacturer or jobber desires to do business with a buyer whom he knows is cutting the prices of his fellow-tradesmen, because they know that the evil of price-cutting never failed to carry ruin in its train. On the other hand a buyer who is a desirable customer knows full well when he has a certain line of goods offered him at a cut price, that he is dealing with a manufacturer who is, in the end, a danger to the trade, and is not honest to either his creditors or himself. When a buyer has bought goods from a manufacturer at a cut price and that manufacturer fails to meet his obligations, that buyer is morally indebted to the creditors of the manufacturer from whom he has bought, because he has in actual fact been receiving goods at less than cost, which has in the end, brought ruin to the manufacturer. We would like some of our readers to send us in their personal opinion of this most-dreaded evil of price-cutting, and see if we can not do something toward eliminating it, by discussing it from the various viewpoints of our readers.



Some Sarcasm.—A very fair altitude in the way of sarcasm was reached by a witness in one of the investigations of politics and contracts now being conducted by district attorneys and grand juries in New York State. After describing a particular piece of highway construction that had cost about \$10,000, the witness declared that with two men and a baby carriage he could have built a better road.

A Sanitary Equipment in a Large Factory

Showing in More Ways Than One How the H. Mueller Mfg. Co., Ltd., Sarnia, Cater to Their Employees—Such an Equipment Pays Compound Interest in Efficiency.

ONE of the latest and most-up-to-date factories which have been built of late is that of the H. Mueller Manufacturing Co., Ltd., Sarnia. Their plant, which is used in the manufacture of their goods, is all to be desired, and altogether too numerous for us to dwell upon in this article. The portion which

are of the monitor type, with sashes, which can be opened or closed at will.

Detail of Heating and Ventilation.

Each shop is equipped with a heating apparatus, consisting of a "Sturtevant" fan, engine and heating coils and guaranteed to maintain a temperature of 70 degrees when the outside temperature is

finishing shops, the air is not re-circulated, but fresh air is drawn from outside continually. In these two shops ducts from the fan are laid under the floor, with risers at various points about 6 ft. high, terminating with a three-branch delivery.

The fan in the iron finishing building is a 120-in. full housing steel fan with single inlet and top horizontal discharge direct connected to a 6-in. x 9-in. steam engine, horizontal type. The pipe coil heater contains 4,445 lineal feet of 1-inch pipe on 6 four-row heater bases. The sections are arranged for a 3-in. inlet, 2-in. drip and 1-in. bleeder, and are completely encased with steel plates connected to the inlet of the fan so that the latter draws air over the heaters. In the brass-finishing building is installed a 7 x 4 $\frac{3}{4}$ -housed steel plate Sturtevant fan, having a right-hand bottom horizontal discharge, and driven by a 7-in. x 10 $\frac{1}{2}$ -in. horizontal steam engine. The indirect heater, containing 6,328 lineal feet of 1-in. pipe, is built in seven 4-row sections of heater bases with the same connections as the above fan, and steel plate jacketed on the top, and two sides connected to the inlet of the fan, so that air is drawn through the heater by the fan suction. There is a 6 x 3 $\frac{1}{2}$ $\frac{3}{4}$ -housed fan in the foundry driven by a 6-in. x 8-in. horizontal steam engine. The heater contains 5,162 lineal

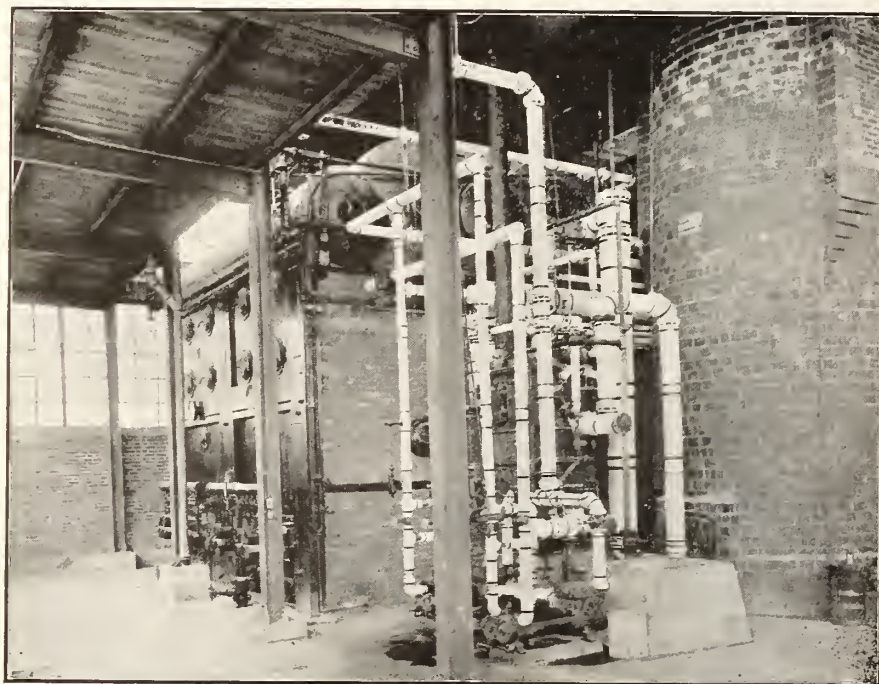


Core department.

is of the most interest to our readers is that of their sanitary, heating and ventilating equipment. In the brass foundry can be seen on either side large galvanized pipes, with three branches on each main vertical pipe. These are installed to deliver warm air to the building, and are supplied with three elbows, pointing in various directions, so that warm air is equally distributed all through the works. If our readers will follow the lay-out plan they will see dotted lines extending from the power house to the various buildings. These lines show the route taken by a system of tunnels. These tunnels are built large so as to enable a person to walk through them, and are made perfectly water-proof.

These tunnels are used to carry all pipe lines to and from the different buildings. The pipe lines convey steam to drive the fans, to supply steam to the large indirect heaters, the compressed air mains and electric conduits, all of which are easy of access in case of trouble. The tunnels are built of concrete, and strong enough to allow vehicles to drive over them. Each building is supplied with a fan, as shown in plan, to supply warm fresh air, hence is both efficient and sanitary. The roofs

20 degrees below zero. In the iron finishing shop the air ducts are carried over the roof trusses, and so arranged that the air can be re-circulated through the building. In the foundry and brass



Gas fired "Stirling" water tube boilers, feed water heater and pumps.

feet of 1-in. pipe. In other respects, this fan is identical with that in the brass-finishing building. Eighty pounds steam pressure is supplied to all the fan engines, and the exhaust steam for the heating coils is supplied at two pounds pressure. Pipes to each unit from the power house are laid in the tunnel.

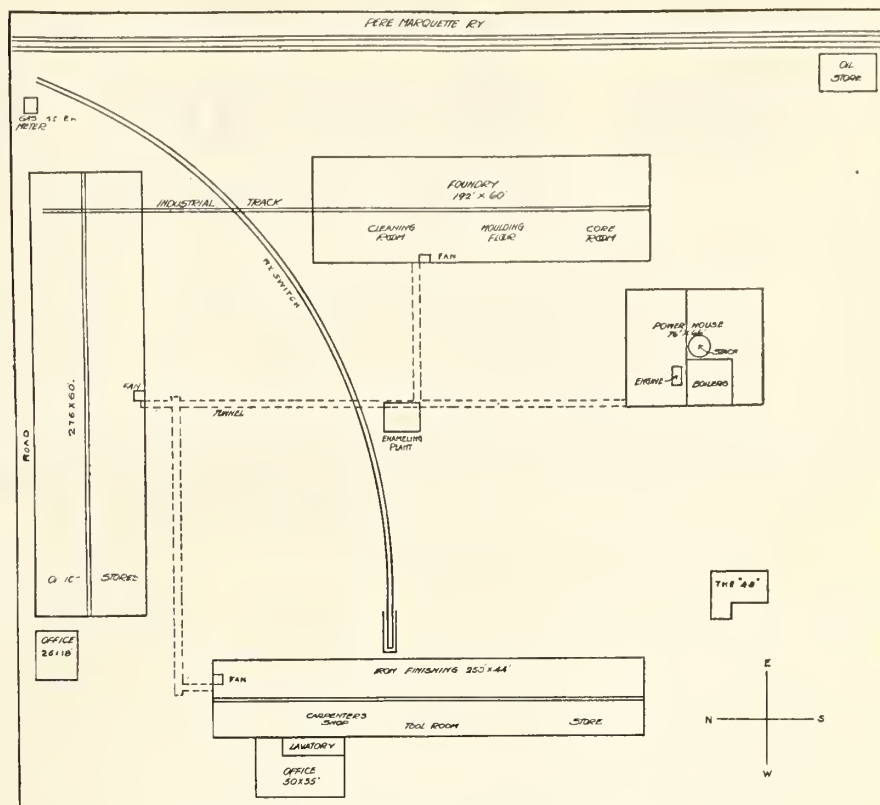
The Boilers.

In the boiler-room are two Sterling water tube boilers, each rated at 250 h.p., and having working pressure of 140 pounds. They are fitted with "Kirkwood" burners for natural gas at a pressure of 8 ozs., a gauge being fitted for indicating the pressure. There are ten burners to each boiler, and these were supplied by Tate, Jones & Co., Pittsburgh. Martin shaking grates are fitted in case it should be necessary in an emergency to change over from gas fuel to coal, the burners being so arranged that the change can be made in a few minutes.

Each building is equipped with a battery of lavatories and w.c.'s of the latest type, and when the "roughing-in" of the soil and waste pipe was done, provisions for further addition to the number was taken into consideration.

Another feature which merits some mention—that is, provision made to keep each building free from dust—each grinding, polishing or buffing lathe is fitted with a very effective design of exhaust hood, which draws all dust away from the operation, and protects the operator from breathing dust or metal particles which flies from the article being ground or polished.

In referring to the sanitary heating and ventilation, during some conversation with one of the officers of the com-



Layout of the H. Mueller Mfg. Co. plant.

pany, it was stated that this feature was carefully considered from all standpoints; that no part of the plant gave better returns as an investment than this equipment, because it was the direct means of keeping employees in the best of working condition, thus catering in no small way to the efficiency of the whole plant. Such sanitary appliances were personally appreciated by one and all.

In conclusion, let us here remark that sanitary and heating engineers would do well to study more the sanitary conditions of factories, offices and workshops, and never failing to point out to the employers how necessary such equipments are for the general welfare of their employees, and how soon the extra cost would be easily wiped out by raising the general efficiency of the whole staff.



Interior of brass foundry.

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

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Circulating amongst Sanitary, Heating and Ventilating Engineers, Gas Fitters, Sanitary Inspectors, City Engineers, Boards of Health Architects, etc.

TORONTO, MARCH 16, 1914

THE CONVENTION PROGRAMME.

THIS year is to be one of successful conventions. It commences with the Ontario Provincial Society Convention which is to be held next week, and if the programme is to be fully carried out, the whole proceeding will be, to say the least, very interesting, and from all reports we are given to understand that a large gathering is to be present. Such conventions should be in every case well attended by all members of the craft. At such a gathering every member should be prepared to be earnest listeners and come with open minds to hear all their several craftsmen may wish to take up and discuss. They should be ready to honestly criticize each matter taken up with a view to improving the present conditions that prevail, all of which are of a vital nature. In looking round and into the conditions of the various other trades, there seems to be better protection, more encouragement, and more unity in their midst. Hence it behooves every honest thinking sanitary and heating engineer to be present at the coming convention, and not only should they be present, but also interested in the general welfare of the craft.



A PROVINCIAL SANITARY BY-LAW.

AMONGST the many subjects to be discussed will be one bearing upon the necessity of a universal provincial sanitary by-law. Such a by-law no doubt would be a boon to the craft. While some incorporated town or city may have some kind of plumbing by-laws, there are scores which have not, and to compile a set of universal by-laws in each province will be a task of no mean order, and such a by-law is without doubt absolutely necessary.

The country residence, the village and all isolated districts are the chief sources for business by those who prey on the public by installing poor, cheap, unsanitary installations. Men who have a very limited knowledge of the trade find it easy to pan off such work where they are free from rigid by-laws, thus making conditions from a sanitary engineering standpoint anything but desirable in our country homes, hence the importance of such a measure being taken up cannot be doubted.

STANDARD HEATING SPECIFICATIONS.

THIS subject is one of very vital importance and should be thoroughly taken up and discussed. It is in a sense a sanitary measure and should be dealt with as such. We in Canada have such a variety of minimum and maximum temperatures, that it requires practical knowledge of the actual local conditions to properly specify and carry out those specifications in the various localities. For instance, one would never dream of allowing the same amount of radiation in all localities. Neither would an engineer using good, sound judgment advocate the same kind of a system under every condition. There is never a week passes but what we hear of persons either losing their lives or having very narrow escapes, all due to defective heating installations and little or no ventilation. Therefore, it would be a very desirable measure to propose some control over the plans of heating and ventilation in our buildings.



A PROVINCIAL APPRENTICE CODE.

IN these days of progress, when every line of calling is becoming more of a profession, there is the necessity of more practical education along those various lines. Not very long ago a plumber who could make his own lead traps, do a certain amount of lead-burning and wipe a good-looking joint, was thought to be all that could be desired. But such is not the case now; he must be well versed in several lines, and in many ways have a general knowledge of mechanical science. He must study the laws of gravitation, condensation, and physics. He must have a certain amount of knowledge in connection with the manufacturing of the various kinds of goods he uses, all of which requires special, practical studies, and to acquire this knowledge properly, the person taking up this business of sanitary and heating engineering should be able to apply his studies from day to day in a practical way. Hence a system of some kind, call it what we may, should be evolved. Therefore Sanitary Engineer endorses the idea of an apprenticeship system, such as would not only assist the new blood, but also be of some assistance in helping those now engaged in the craft to become more competent.

TECHNICAL EDUCATION PROBLEMS.

MUCH has been said from time to time on this subject, and much more will be said, we hope. It is about the only solution in the opinion of Sanitary Engineer that will help to put the calling of those engaged in the sanitary, heating and ventilating trade on a good, sound basis. From a practical standpoint much is lacking, and from a monetary view, it is anything but rosy. If the business of sanitary and heating engineers is to be improved, we, as a whole, require more business education, and it is only by hard study that we will ever appreciate the actual cost value of our labors, and thus charge for those labors, at the same time being sure that fair value is being given and nothing more. It would be a very conservative statement to make if one said that less than 50 per cent. who are at present actually engaged in the trade are really competent, all because of the lack of education that can be acquired by studying in our spare time at such institutions as are now at the disposal of all. Let us hope the day is not far distant when every youth will be devoting more time to study, and in that way increase the efficiency of the craft as a whole.

BULK AND SUB-CONTRACTING.

THIS subject is one which requires a great deal of thought. It is though, rather a question as to whether the sanitary and heating engineer shall be the cats-paw or not, of the various builders, contractors or architects. The craft as a whole are being used to make more money for the aforesaid class of men that they are making for themselves.

The speculative builder will get a set of plans and ask the sanitary and heating engineer to tender on say the plumbing and heating separate, or together. He will ask for these tenders and never think of the value of time that is required to get out these tenders. Then he will peddle them all over the city, trying to cut prices, and in the end either prevails upon the first tenderer to cut his price or give the contract to a competitor. The architect is the same, he sends out several sets of plans and requests that tenders be submitted, but never fails to exact every cent he can get out of the owner, for every move he makes, yet actually gets the information free. Then in 99 cases out of 100 it is a matter of "kissing goes by favor." The time is ripe now for the craft to rise up

in a body and demand a charge for every tender submitted, and to be consulted by the owners just in the same way that architects are consulted. If every member of the craft was paid a fee for his tender on a percentage basis, there would be some encouragement, but at present and under present conditions, he is simply in the hands of the speculative builder and the architect whose only aim is to charge for all the knowledge they get free from sanitary and heating engineers.

WHAT NEXT?

A FEW days ago one of the Toronto city fathers proposed that the city architect go into the matter respecting the domestic heating appliances, which of recent date have been dealing out death and narrow escapes from death from the effects of coal gas or fumes from supposed defective furnaces, etc. Now why in the name of common-sense don't we get a practical heating and ventilating engineer to make a report? Then both the council and public would have something worth while. This loading the architect with too much of the kind of work he knows very little about is reflecting discredit upon his profession, and is unfair to ask him to attempt such a task.

EDITORIAL COMMENTS.

Don't forget!

* * *

Meet me at the convention.

* * *

And remember the dates are March 19, 20, and 21. Nineteen fourteen.

* * *

Be on hand early and in earnest.

* * *

Be a booster, not a knocker.

* * *

Knockers are generally hung on doors, some should be hung on trees.

* * *

A low-priced sanitary and heating is generally cheap. GOOD AND CHEAP.

* * *

But a fair-priced installation is very seldom any other than cheap. CHEAP AND GOOD.

The Ontario Society of Domestic Sanitary and Heating Engineers

Invite you to attend the Third Annual Meeting of the Society to be held in the Canadian Foresters' Hall, 22 College Street (near Yonge St.)

On Thursday, Friday and Saturday, March 19th, 20th and 21st, 1914

Write to G. F. Frankland, Corresponding Secretary, 1093 Bathurst St., Toronto, for full particulars.

The Ontario Society of Domestic Sanitary and Heating Engineers

Incorporated 1911

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HARRY HICKS, Vice-President.
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Examination
J. MARSHALL, Port Arthur.

COPY OF LETTER SENT TO MEMBERS OF THE TRADE IN ONTARIO.

Toronto, March 7th, 1914.

GENTLEMEN:—

Enclosed find invitation to attend Third Annual Meeting of the Ontario Society of Domestic Sanitary and Heating Engineers, to be held in Toronto, commencing at 9 a.m., Thursday, March 19th, 20th, and 21st, in the Canadian Foresters' Hall, 22 College Street, just west of Yonge St.

At this meeting there will be many items of interest and of vital importance to the Trade, brought before the convention to be discussed and disposed of, which have been hanging fire for considerable time.

And the Directors want everybody to attend this meeting, and pass their opinion on same, as it will affect everybody in the Trade throughout Ontario. Some of the most important questions to come up will include the following:—

THE PROPOSED WORKMEN'S COMPENSATION ACT.

This will affect every one employing help in our Trade.

A UNIVERSAL PROVINCIAL SANITARY BY-LAW.

This is to cover the Province, and data has been secured by the Directors pertaining to present conditions.

THE PERMANENT SECRETARY AND ORGANIZER.

The Directors have about provided ways and means for a Permanent Secretary, and they must have the endorsement and approval of the Convention, as this is the only way to place our Society in its proper position. The Toronto Committee are providing a Permanent Office.

THE MANUFACTURERS AND SUPPLY HOUSES.

This question took up considerable time of our last Annual Meeting, and a strong Committee was appointed at that time to deal with same, of which Mr. E. H. Russell, of London, was chairman. Their report will require the attention of all engaged in our Trades throughout Ontario.

THE QUESTION OF ANNUAL MEETING PLACE.

Will it be in the best interests of our Society to hold the Annual Meetings at different places each year?

**THE CANADIAN SOCIETY OF DOMESTIC
SANITARY AND HEATING ENGINEERS.**

Their Annual Convention will be held in Ottawa, on June 9-10-11, and at our coming Annual Meeting the appointment of delegates to attend the Canadian Convention will take place, and full instructions given to the appointed delegates regarding the Ontario Society's attitude on the question of the Canadian Society becoming an executive body. The Canadian Society Convention, being held in Ontario this year, it would seem an opportune time for securing our desires in this matter.

Among other items of importance that the Directors have dealt with this past year are the following:—

STANDARD HEATING SPECIFICATION.**APPRENTICE CODE FOR THE PROVINCE.****THE QUESTION OF TECHNICAL EDUCATION.****BULK CONTRACTING AND SUB-CONTRACTING.****THE ENDOWMENT FUND OF THE ONTARIO
SOCIETY OF DOMESTIC SANITARY AND HEAT-
ING ENGINEERS.**

The Directors earnestly desire a full attendance to this our 3rd Annual Meeting, as the business that will come before the meeting will undoubtedly redound to the future success of our Society, and they ask that you reply at once, stating your intention to be present, or, if not, let them have your opinion on the above questions.

Arrangements have been made with the Hotel Grosvenor, 491 Yonge St., corner of Alexander St., to accommodate our members during the Convention. The rates are \$2.00 a day and up, "American plan." This hotel is closely situated to our Convention hall, and the best of service is assured. If you require accommodation reserved for you, let us know your requirements, and we will attend to same.

Trusting that you will be present and that this will be a banner Convention for our Society,

I remain,

Yours respectfully,

G. F. FRANKLAND,

Corresponding Secretary,

1093 Bathurst St., Toronto.

The Third Annual Meeting of the Ontario Society of Domestic Sanitary and Heating Engineers

Incorporated 1911

To be Held in Toronto at the Canadian Foresters' Hall, 22
College Street, Just West of Yonge Street,
March 19, 20 and 21, 1914

Directors.

F. R. Maxwell, President.	Harry Hicks, Vice-President.
Wm. Mansell, Hon. Director.	E. Lewis LeGrow, Sec'y Treas.
G. F. Frankland, Corr. Secretary, 1093 Bathurst St.	

Reception Committee.

Geo. Kirtley, Chairman.	H. Hillier.
J. E. Fullerton, Secretary.	T. Price.
A. F. Passmore.	N. Swanston.

PROGRAMME.

Thursday, March 19, 1914, 1st day.

Morning Session.

9.30 A.M.—Meeting of the Board of Directors and the Executive Committee.

Afternoon Session.

1.30 P.M.—Enrollment.
2.30 P.M.—Opening Address by Mayor Hoeken of Toronto.
Reception of Members.
2.45 P.M.—Roll Call.
3.00 P.M.—Appointment of Special Committees.
3.15 P.M.—Suggestions from Chairmen of Committees.
3.30 P.M.—Resolutions and general discussion.
4.30 P.M.—Address by W. A. Porter of the W. A. Porter Co., on "Overhead Expense as Incurred in Our Business."

6.30 P.M.—The members of the Society will be the guests of the Toronto Committee to dinner and evening of entertainment at their annual "Canadian Night" at Albert Williams Assembly Parlors, 179 Yonge St.

Friday, March 20, 1914.

Morning Session.

9.00 A.M.—General business and report of the Board of Directors.

Afternoon Session.

1.30 P.M.—Reports will be received from the following standing committees:
Sanitary—R. G. Sturgeon, Peterborough. Legislation—J. T. Blyth, Ottawa.
Heating—H. G. Waterman, Toronto. Educational—J. E. Farrell, North Bay.
Arbitration—J. H. Caslake, Collingwood. Examination—J. Marshall, Port Arthur.

Auditors.

Also the following Special Committees:

Resolution	Nominating
Entertainment	"Manufacture and Wholesalers"

4.30 P.M.—Election of new Directors and Chairmen of Committees. Sanitation.
5.00 P.M.—Address by Dr. John W. S. McCullough, Chief Officer of Health, Provincial Board of Health, Ontario.

Saturday, March 21, 1914.

Morning Session.

9.00 A.M.—New or unfinished business.
At the conclusion of business the members will visit in a body the James Robertson Company's, Limited, new showrooms and warehouse at Spadina and Sullivan Sts.

A Voice From New Zealand

Editor of Sanitary Engineer:

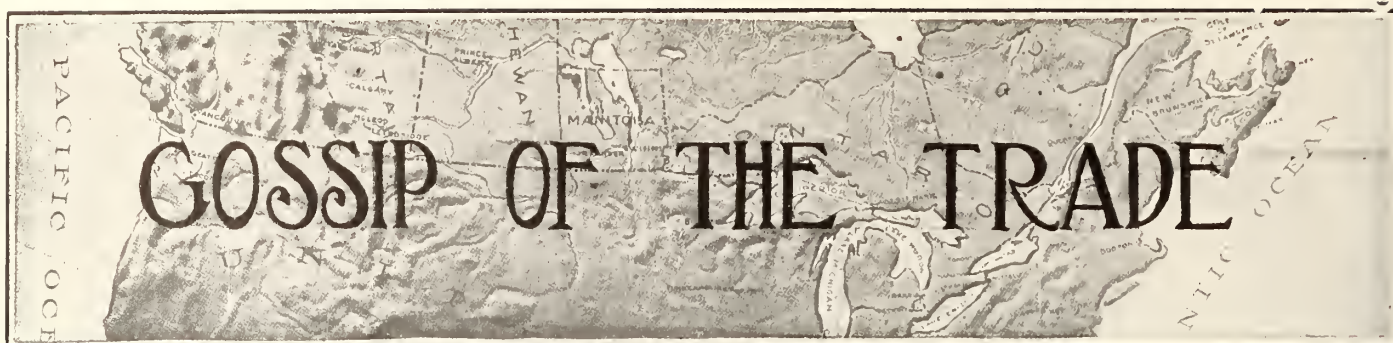
I am enclosing you a further subscription. I have been very pleased with the SANITARY ENGINEER and intend to continue being a subscriber, as there are often items of great interest to the trade to be found in its pages, although the class of work is different here. I worked at the trade in Canada for some time, and know the class of work you do there. Here ninety-five per cent. of the houses are covered with corrugated iron. As regards the sanitary work, it is up to a fairly high standard, and is improving all the time. We are just completing a Main Sewerage scheme at the cost of half million of pounds, and it has made our trade busy, and will be for some time to come. A law has just been passed in New Zealand which is of great importance to the trade, and is called the Plumbers Registration Bill. The object of the Bill is to require every man engaged in the trade to pass an examination in practice and theory, unless he held a recognized Sanitary License. The first examination was held last December. They have received up to date about fifteen hundred applications; out of that number about six hundred qualified and received Registration. This Board is composed of five officials, as follows: The Chief Health Officer, City Engineer, Government nominee, Master Plumber, and a Journeyman Plumber. They are elected for three years. It would be a good thing if legislation like this could be passed in all parts of the world. We have just held our annual conference in this city, and I had the pleasure of being one of the delegates. We put in a lot of work, for there were twenty-three numbers on the order paper. I put in one for the abolishing of giving estimates free, and it received a fairly good hearing, but those present were doubtful about it being workable, on account of there being so many outside plumbers that do not belong to any Association, but I do not intend to let it drop. I would be pleased to send you a further report of this conference if you would care to publish it in your paper.

I am pleased to say that trade is fairly good, and hope it will continue so for some time, being a young country and growing fast. The great drawback to New Zealand has been its isolation, but with better shipping, we are beginning to be more known.

I will now conclude, wishing you all success for your paper.

Yours faithfully,
W. S. F.

Auckland, New Zealand.



CLUFF BROS.' NEW BUILDING.

Another handsome structure is contemplated for the downtown section in Toronto. Messrs. Cluff Bros., dealers in plumbing supplies, having made arrangements to pull down the building on their present site at the southeast corner of Church and Lombard streets and erect a four-storey office and warehouse building combined.

The property is immediately adjoining the old public library on Church street, and has a frontage of 95 feet. The plans call for a very ornate and substantial building of steel, granite and terra cotta and will contain on the ground floor the general offices of the company and spacious showrooms for the display of their plumbing specialties.

PLUMBING BUSINESS CHANGES HANDS.

Charles T. Bull, plumber has purchased the plumbing business of E. B. Dixon, at 275 Talbot street, Brantford. Mr. Bull will conduct his establishment as well as his old one on Hiawatha street, for the present.

NEW BUSINESS OPENED.

Stewart & Edwards, is the name of a new firm which commenced business in Regina as plumbing and heating engineers. Their business premises are at the corner of Eighth and Albert streets.

BRANTFORD FEARS OUTBREAK.

Brantford is in danger of a typhoid fever epidemic as a result of the drinking water having become polluted from the railway camps along the banks of the Grand River.

OPENED UP IN BUSINESS.

W. R. Craven has opened up an establishment in the sanitary and heating engineering business in Winnipeg.

DISSOLVED PARTNERSHIP.

The firm of Gallagher & Walker, sanitary and heating engineers of Weyburn, Sask., have dissolved partnership, and

Mr. Walker will now carry on the business.

NEW BUSINESS.

McClelland & Mathews, sanitary engineers and sheetmetal workers, have opened up an establishment in Medicine Hat recently.

NEW HUMBOLDT FIRM.

Messrs. Ritz & Yoerger, of Humboldt, have disposed of their hardware business to Mr. McKinney, and are now engaged in the formation of a new company to be known as the Pioneer Plumbing & Heating Co., Ltd., Humboldt.

ANOTHER SANITARY CONVENIENCE.

Drying the hands by means of a current of warm air is a modern sanitary device installed in a Washington office building. The electric hand drier is an upright cabinet about 3 feet high. An opening at the top, over which the hands may be held, gives egress to a current of air blown from within, and controlled by a lever operated by the foot. When the lever is depressed, the electric current is switched on the blower, and the air is forced through a heating coil, which brings it to a proper temperature. Thirty seconds is all the time required for the drying process, and the cost per hundred pairs of hands is just one cent. This contrivance meets sanitary requirements, and threatens to supplant, if it does not abolish, both the roller towel and its paper substitute.

MODERN METHOD OF HEATING.

The Canadian Engineering Co., Ltd., of Montreal, Toronto and Winnipeg have issued a splendid book entitled "Modern Methods of Heating, Ventilating, Sanitary and Electric Designs." It is illustrated and shows some very interesting data which all sanitary and heating engineers should know, including very useful information on forced hot water circulation.

USEFUL DATA.

One of the nicest booklets recently issued is that of the C. A. Dunham Co., Ltd., Toronto. It is full of valuable data which should be known by all sanitary and heating engineers, and is entitled, Dunham Specialties. Those wishing to acquire one of these books should apply at once to the C. A. Dunham Co., Ltd., corner of Primrose Avenue and Davenport Road, Toronto.

BUSINESS CHANGE.

The business lately owned by Messrs. Watson & Paul, Montreal, manufacturers of syphons and other accessories for septic tanks, has been recently taken over by Alex. I. Mearns.

SANITARY DRINKING FOUNTAINS.

The N. O. Nelson Manufacturing Co., St. Louis, Mo., are issuing a splendid catalog dealing with sanitary drinking fountains. It is beautifully gotten up and deserves a place on the catalogue



file of every sanitary engineer. They can be procured by writing the above firm.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

FLUX FOR SOLDERING ALUMINUM.

Editor Sanitary Engineer.—Please inform me in your next issue what is the best flux to use for soldering aluminum.

J. H. B.

Replying to J. H. B., we may state that to our knowledge there is no such flux in existence, and the person who invents such a flux, will not only be a benefactor to the metal world, but will have his fortune made. Of course, aluminum can be welded by an electric process, by oxy-acetylene process, and small repairs can be made by soldering with an alloy called aluminum solder. This can be bought from Canadian Hanson Van Winkle Co., Ltd., Morrow Ave., Toronto, or any other foundry supply house.—Editor.



CONCEALED AIR CHAMBERS.

Editor Sanitary Engineer.—The other day I was asked if there were such a thing as a concealed air chamber for high-backed sinks and lavatories, and not having seen such a thing could not answer the question. I have been in the habit of making the air chamber of pipe and fittings as per sketch. Please let me know in Sanitary Engineer if there is such a thing as an air chamber that can be concealed, and also what they are like and how they are attached to a sink or a lavatory.

A. C. T.

Replying to A. C. T., we show in Fig. 2, what is known as a concealed air chamber, and the way they are attached to either sink or lavatory. These air chambers can be got from all jobbers ready tapped either $\frac{3}{4}$ or $\frac{1}{2}$ inch for iron pipe, they are made both in brass and iron galvanized.—Editor.

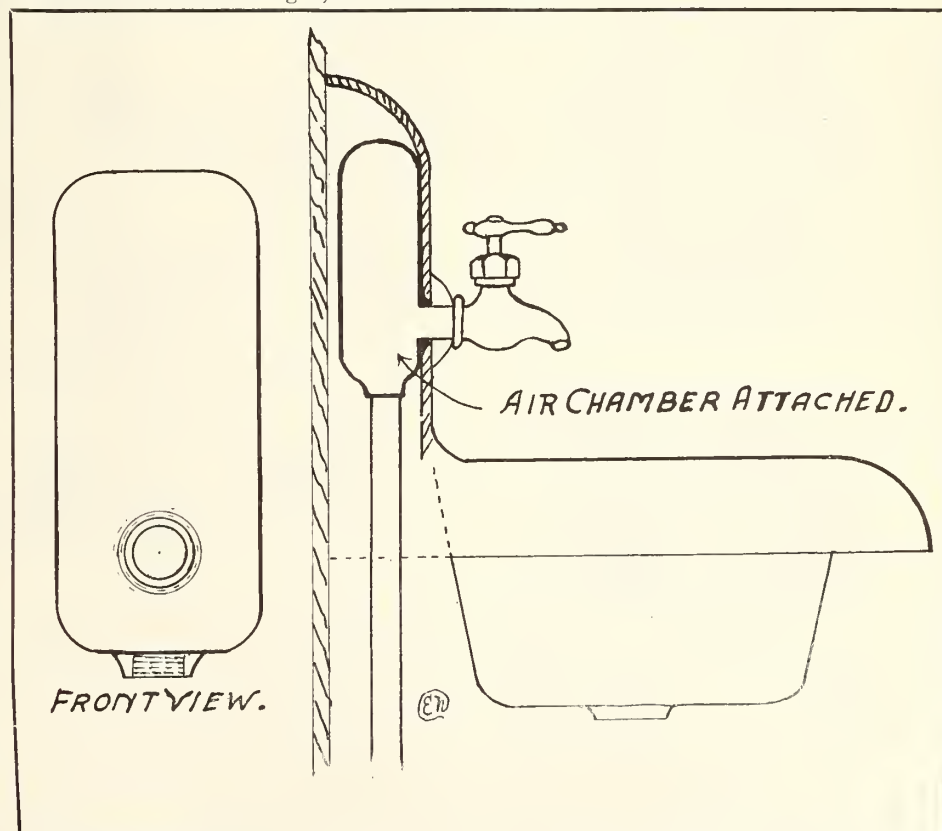
HOW IS IT DONE?

Editor Sanitary Engineer.—I heard some time ago that it was possible to put a washer on the tap which is on the bottom of a range boiler connection, without emptying the boiler, and can't for the life of me figure it out as to how it is done. Could you please let me know at an early date in the pages of Sanitary Engineer.

Puzzled.

In reply to "Puzzled," we may state this is a very simple "kink" which very few know, but one which the writer has used for nearly 20 years. It can only be done providing every tap on the water line is tight, as well as

the stop cock on the cold water supply to the boiler. Here is the method to adopt: 1st turn off the cold supply cock off at the top of the boiler, and see that all the hot water taps are closed and do not leak, then take off the bonnet in the usual way and put on the washer. It is as well to have a pail under the tap for fear some of the other taps leak slightly, the same action takes place as it does when a tube is filled with water and corked at one end then turned upside down, the water will not run out until an admission of air takes place. This "kink" will save hours of work emptying and re-filling the boiler.—Editor.



Processes Necessary to Complete a Common Globe Valve

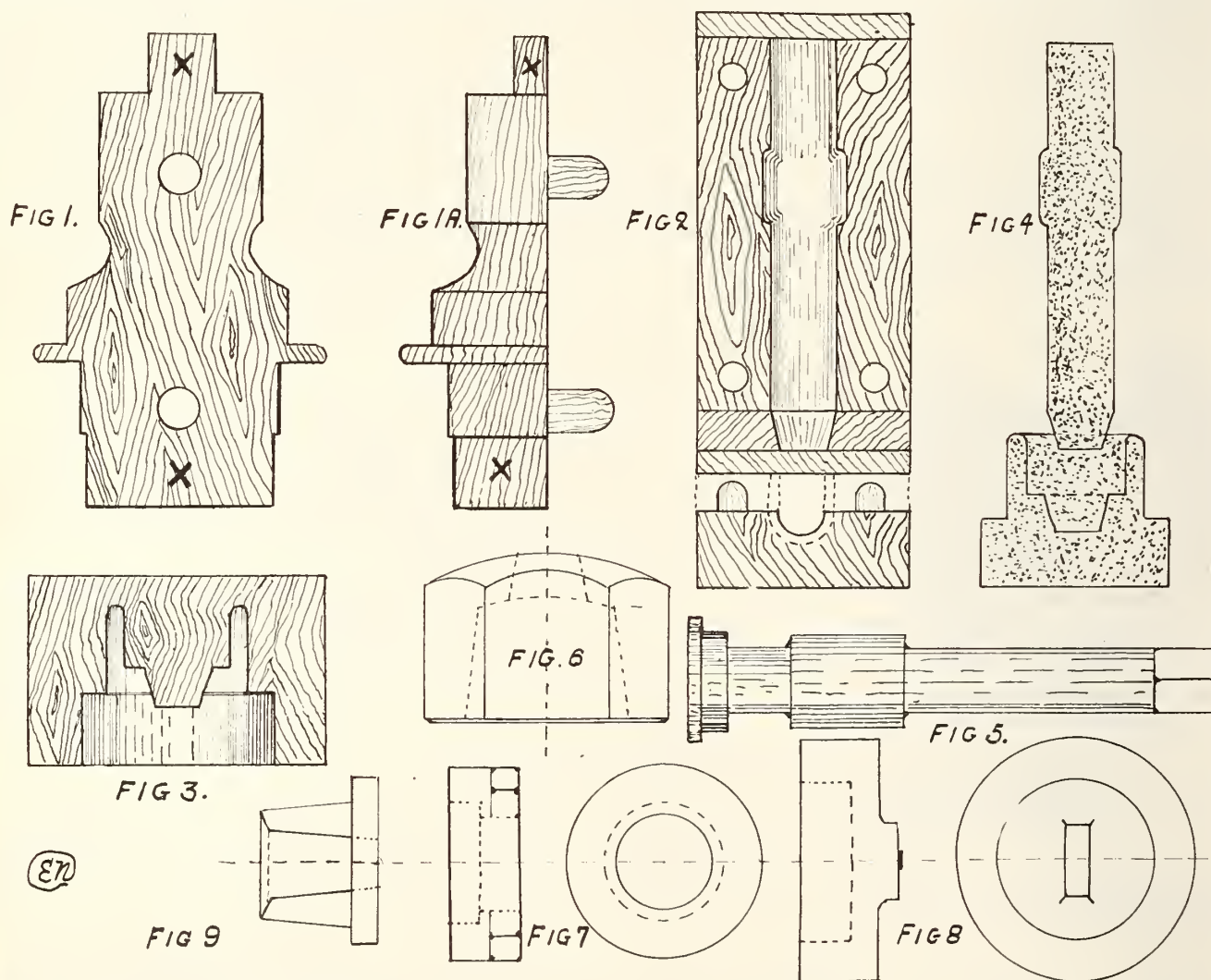
A Series of Articles Showing in a Simple Way the Operations Required to Complete a Nickel-plated Globe Valve—Following the Steps From the Drafting Office to the User.

IN February 16 issue we concluded our article on this subject with the description of cores and core boxes for the globe valve. We will not take up the pattern-making necessary for the bonnet of valve and other working parts. Fig. 1 and 1A show two views of a half pattern of bonnet with core prints marked X.X. These prints are necessary to hold the cores in proper position in the sand, and will be better understood by the reader as we go on. In this pattern two core boxes are required as shown in Fig. 2 and 3. Fig. 3 may be turned out of one piece of wood. Of course the reader must not forget that the usual care must be exercised in allowing for the various shrinkages as pointed out in our first instalment.

There is a lot of machine work to be

done on this portion as all working parts are embodied in the bonnet. Fig. 4 shows the two cores, which are made of sand and oil or in some cases, sand and flour is used; then these cores have to be baked. Fig. 5 is the spindle. These spindles are now being made from brass rod, particularly the smaller sizes. We will, however, show a pattern. Fig. 6 is the nut for the bonnet; these, too, are being made from hexagon rod when for small-sized valves. In the pattern shown herewith, note the inner dotted lines, these patterns are made in this way so as to allow the pattern to be easily drawn from the sand, thus requiring no core. Fig. 7 shows pattern of nut for valve, and Fig. 8 shows the valve. Fig. 9 shows the packing gland. In the lower-priced valves this piece is not supplied,

and there is a slight difference in the construction of the bonnet, when these glands are used. Then there is the valve wheel. These are mostly made of cast iron and require the usual care in both the pattern-making and molding, so as to produce a clean casting. These handles are then ground where they have been gated, and afterwards placed in a tumbling mill. The next operation is the japanning. This is not the common black japan, but a japan which requires baking. In a future issue we will show the different processes necessary to turn out this valve. We have, thus far, only shown the processes which have produced the patterns. The molding operations will be next taken up, followed by the machine work, dipping, testing, packing and shipping.

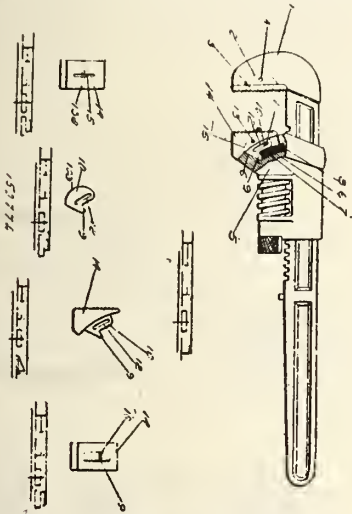


NEW CANADIAN PATENTS

No. 150,774.

Harold Peery Heninger, Portland, Oregon, U.S.A., 30th September, 1913; 6 years. Filed 18th August, 1913. Receipt No. 228,034.

Claim.—1. In a wrench, a shank having a head, a second head mounted for moving on the shank to and from the first-mentioned head, the face of the second-mentioned head in the direction of the first-mentioned head having a recess, and being curved convexly from



No. 150,774. Wrench.

the shank away from the first-mentioned head, a jaw having a face conforming to that of said head and slidably disposed thereon, a guide on to the jaw having a slot formed parallel with said curved faces and an inner face also parallel therewith, disposed in said recess, a pin secured transversely in the second-mentioned head through said slot, a spring fitted in the bottom of said recess, and a lug projecting from the outer end of the guide to bear upon said spring to normally hold the jaw at its outer limit.

2. In a wrench, a shank having a head, a second head mounted for moving on the shank to and from the first-mentioned head, the face of the second-mentioned head in the direction of the first-mentioned head having a recess, and being curved convexly from the shank away from the first-mentioned head, a jaw having a face conforming to that of said head, with a longitudinal central kerf, and slidably disposed thereon, a guide detachably secured in said kerf and having a slot, formed parallel with said curved faces and an inner face also parallel therewith, disposed in said recess, a pin secured transversely in the second-mentioned head through said slot, a spring fitted in the bottom of said recess,

and a lug projecting from the outer end of the guide to bear upon said spring to normally hold the jaw at its outer limit.

3. A wrench, having a fixed head and a movable head co-operating therewith, the working face of each head being provided with a central kerf, a jaw having a kerf in its inner face fitted upon the working face of each head, and a connecting member adapted to be secured in each pair of kerfs for retaining each jaw upon its respective head.

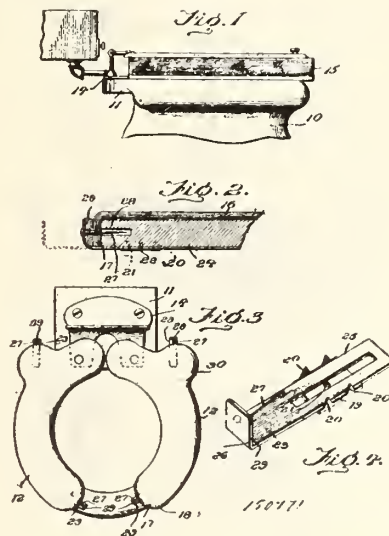
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No. 150,771.

Frank J. Graves, Springfield, Massachusetts, U.S.A., 30th September, 1913; 6 years. Filed 2nd May, 1913. Receipt No. 223,915.

Claim.—1. A paper supporting means for toilet seats, comprising a member slidably disposed on the toilet seat, paper engaging means carried by said member and disposed to contact with and support the paper arranged on the seat.

2. A paper supporting means for toilet seats, comprising a plate slidably mounted on the under face of the seat, said plate being disposed with an offset and a prong carried by the offset and arranged to engage the edge of a pad of paper which is placed on the seat and clamp the pad to the seat.

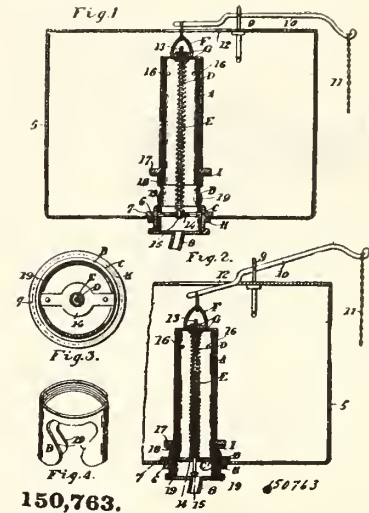


150,771. Seat for Water Closets.

3. A paper supporting means for toilet seats, comprising a plate formed with prongs and arranged on the underface of the seat, the body portion of said plate being spaced from the seat, a second plate formed with an elongated slot, a screw passing through the first-mentioned plate and disposed within the elong-

ated slot of the second plate, said second plate being provided with an extension bent at right angles to its body portion, and a prong carried by said extension and disposed to engage a pad of paper and maintain the same on the seat.

4. A paper supporting means for toilet seats, comprising a member disposed on the under face of the toilet seat, paper engaging means carried by said member and disposed to contact with and support the edge of paper arranged on the seat.



150,763.

Valve for Flushing Tanks.

5. A paper pad retaining means for toilet seats, comprising a member slidably mounted on the seat, said member being formed with an extension disposed to engage with the paper arranged on the seat.

6. A paper pad retaining means for toilet seats, comprising a member slidably mounted on the seat, and a paper engaging member carried by the first-mentioned member and disposed substantially parallel with the same.

* * *

No. 150,763.

Gennaro De Rosa, New York City, New York, U.S.A., 30th September, 1913; 6 years. Filed 17th April, 1913. Receipt No. 223,324.

Claim.—The combination with a flush tank formed with an opening, a bushing secured in said opening, a shell mounted in said tank and having a valve lip to engage the edge of the bushing to prevent the escape of water from the tank, an operating lever connected to the shell, the connection preventing rotated movement of the shell, a spider arm bridging the bushing, a rod connected to the shell and slidably mounted in the arm, a spring encircling the rod and bearing on the spider and against the shell and a

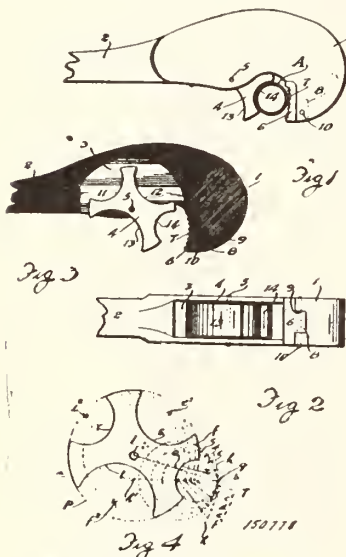
collar removably secured to the shell formed with opposing openings in the wall thereof, said collar being secured to the shell below the valve lip thereof, and the openings therein formed to permit the collar to embrace the spider arm when the shell is in lowered position.

* * *

No. 150,778.

Thomas Hinds, Winnipeg, Manitoba, Canada, 30th September, 1913; 6 years. Filed 7th July, 1913. Receipt No. 226,502.

Claim.—1. A wrench for varying sized pipes presenting a fixed jaw presenting a common gripping point for the various



No. 150,778. Wrench.

sizes of pipes, and a co-acting pivotally mounted rotary jaw having portions of the margin thereof cut away to present re-entrant curves of varying radii corresponding to the radii of the various pipes, as and for the purpose specified.

2. A wrench for varying sized pipes presenting a fixed jaw presenting a common gripping point for the various sizes of pipes, and a co-acting pivotally mounted rotary jaw having portions of the margin thereof cut away to present re-entrant curves or varying radii corresponding to the radii of the various pipes, said pivot being located in a horizontal plane above the horizontal plane containing the contact point of the stationary jaw, and as for the purpose specified.

3. A wrench for gripping pipes of various diameters, comprising a stationary jaw designed to engage the various sizes of pipes at a constant point on the jaw, and a pivotally mounted rotary having portions of the margin thereof cut away to provide suitably spaced re-entrant curves of varying radii corresponding to the different radii of the pipes, said rotary jaw being designed to co-operate with the stationary jaw to grip the various pipes, the centres of the

pipes in the various gripped positions all being contained within a straight line passing below or beneath the pivot of the rotary jaw, as and for the purpose specified.

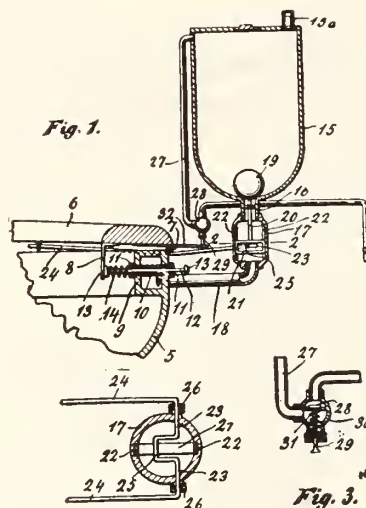
4. A wrench for gripping pipes of varying diameter comprising a handle extending into a fixed gripping jaw, the fixed jaw having the gripping faces thereof located in the arc of a circle having a greater radius than the radius of the largest pipe to be gripped, and a co-acting pivotally mounted rotary jaw carried by the handle and having portions of the margin thereof cut away to present suitably spaced re-entrant curves, the radii of the various pipes to be gripped, the pivot point of the said rotary jaw being contained in a horizontal plane located above the horizontal plane containing the centre point of the arc containing the stationary jaw, as and for the purpose specified.

* * *

No. 150,785.

Edward Kersey, Chicago, Illinois, U.S.A., 30th September, 1913; 6 years. Filed 12th April, 1913. Receipt No. 223,139.

Claim.—1. The combination with a closet bowl having a hinged seat, of a flushing apparatus comprising a supply tank, a casing connected to the tank and the bowl, a valve controlling the flow from the tank, a crosshead slidably mounted in the casing and open on two opposite sides, a stem projecting from the crosshead and adapted to unseat the

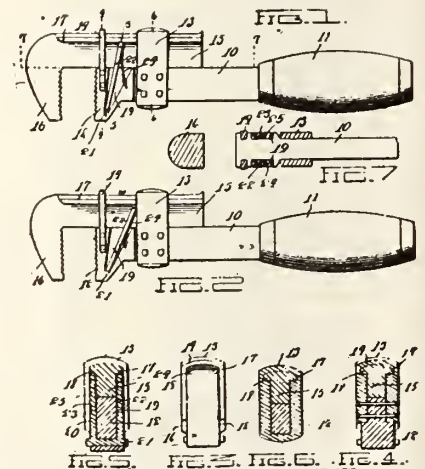


150,785. Flushing Apparatus

valve, a rock shaft extending transversely through the casing and having intermediate its ends a crank portion which is located in the crosshead, arms extending from the rock shaft and connected to the seat, a finger extending from the seat, and a spring actuated slidable stem

carried by the bowl and extending into the path of the finger.

2. The combination with a closet bowl having a hinged seat, of a flushing apparatus comprising a supply tank, a casing connected to the tank and the bowl, a valve controlling the flow from the tank, a crosshead slidably mounted in the casing and open on two opposite sides, a stem projecting from the crosshead and adapted to unseat the valve, a rock shaft extending transversely through the casing and having intermediate its ends a crank portion which is located in the crosshead, arms extending from the rock shaft and connected to the seat, a finger extending from the seat, a casing mounted transversely in the flushing rim of the bowl, and a spring actuated slidable stem carried by said casing and extending into the path of the finger.



No. 150,773. Wrench.

No. 150,773.

Fernand O. Guesdon, Vancouver, British Columbia, Canada, 30th September, 1913; 6 years. Filed 7th July, 1913. Receipt No. 226,534.

Claim.—A wrench comprising a shank having one end terminating in a handle and the other end in a fixed jaw, aligned eye members at one edge of the shank, a movable jaw having a stem slidably arranged in said eye members, lateral flanges on the sides of said stem respectively, said fixed jaw being provided with corresponding V-shaped recesses opening through the edge thereof adjacent said shank, a shaft journaled transversely of the movable jaw, arms fixed on the ends of said shaft respectively and movable in said recesses respectively and adapted when rotated toward the movable jaw to engage said flanges respectively with their free ends whereby said movable jaw is locked against movement away from the fixed jaw, and a leaf spring anchored in each recess and engaging with its free end the adjacent arm to move the free end of the latter into engagement with a respective flange.

Problems For Sheet Metal Workers

THE problem we intend to take up, as will be seen in Fig. A, is one showing how to develop the various patterns required in the make-up of a tea pot with loose strainer. It may, however be stated that we do not show how to make the lid, because there are so many shapes and often where tea pots are made up pressed lids are used, though a lid may be made by cutting a piece of material a little larger and raising it dome shaped with a raising hammer. The tea pots if made up of 14 oz. copper make a very serviceable piece of goods and are capable of withstanding a lot of hard usage. The strainer is a handy addition and with such an attachment, the tea leaves are not apt to prevent the tea from pouring out, as happens with the tea pot which has a strainer fastened in the spout.

We will first draw any vertical line A, then having determined the height and shape of tea pot intersect line A, as shown at CD. Then erect lines which are to give shape of tea pot until they intersect centre line A, making centre B, from which to develop the pattern for the tea pot body. The same rule is fol-

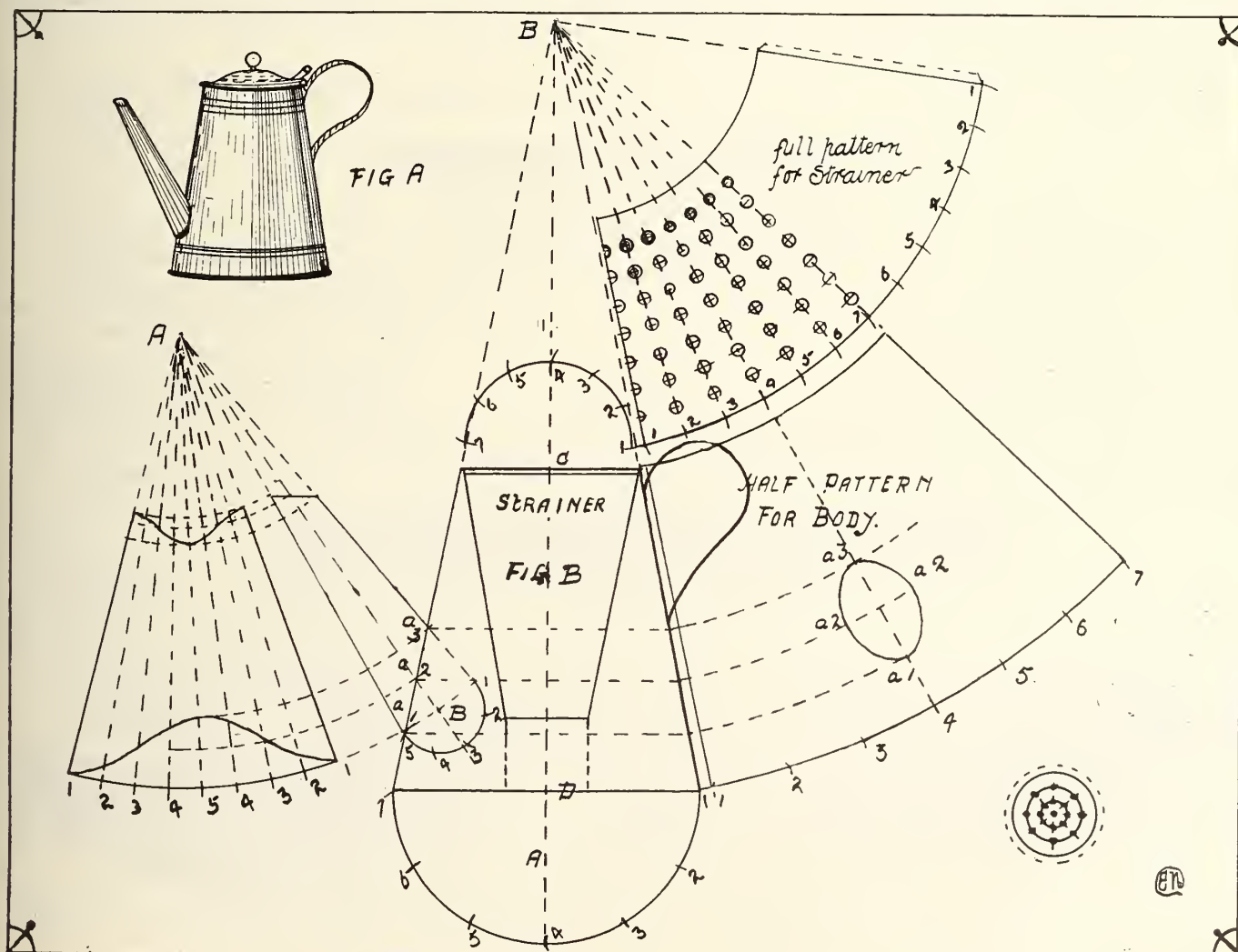
lowed as is carried out in all vessels of a like shape, take compasses and place point at B, and draw arc for body about three times in length which the body is in diameter, then place compass at D and make half circle as shown, and measure off in equal parts. Transfer these measurements 1, 2, 3, 4, 5, 6, 7 to the arc as shown; this will give a half pattern, then allowance must be made for the seams. The handle is such a simple matter that we do not require to take up space with it. We will now draw the spout, this should be first drawn on to Fig. B, and by erecting the lines as shown a point will be developed A, then divide the bottom measurement of the spout into equal parts and draw centre line from A to B on spout, this being the centre.

Then using A as centre make various arcs as shown from a1, a2, a3. The arc at a1 requires to be three times in length that of the diameter of the spout at that point. Now using B as centre make an arc and divide same into equal portions, transferring these measurements to arc a1. Having done so, draw lines from centre A, down to 1, 2, 3, 4, 5, 4, 3, 2, 1.

When this is done repeat the operation at the narrow portion of the spout, then it will be seen that these lines will intersect the arcs a1, a2, a3. Then draw the line shown which actually meets at stretchout figures 1, 3, 5, 3, 1. The same at smaller end of spout.

The hole in the body which is required for the spout has now to be cut. This is done by first drawing lines across the elevation of body from a1, a2, a3, and then describing arcs on the pattern of the body to the centre of the pattern. This being only the half pattern we have shown it there, but this hole should be shown in centre so as to have the seam at the back of the tea pot under where the handle is attached. This hole should be cut a shade larger so that the spout may be a tight fit and then peened over.

We will now pass on to the strainer. This is really developed and may be cut from the same piece of material as the body of the tea pot, the same arcs being drawn, using B as centre, then use the stretchout measurements as divisional lines, drawing several arcs according to the amount of perforations.



Plumbing and Heating Markets

MONTREAL.

March 10.—At the present time the general feeling all along the line is a little dull, due, of course, to the season. The spring trade has not yet started in, and will not for another three weeks, and until that time we cannot tell what the general feeling among the retail trade is. One thing which we cannot overlook is the fact that at the present time there is not the same amount of work being carried on as there was one year ago. Business is going to be a trifle slow for a time, but there is no doubt that it will eventually round up into a good season, and when the cold weather sets in again the amount of work done ought to compare favorably with that of last year. This year will just be the opposite to last. In the early months of last year the trade was kept pretty busy on work, which was carried on during the winter months; but, as we all know, the building operations were curtailed greatly last fall, with the result that there is not the number of jobs ready for the trade this spring. It will all rest now with the number of jobs which are to be opened up as soon as the weather permits. Until these jobs are ready for this trade, then, business will be a little slack. The banks will really have control of the situation, and if they are prepared to advance money for building purposes, then there should be no shortage of work by mid-summer. Manufacturers and jobbers are very optimistic as to the future, but still they do not look for any great rush this spring. Stocks are not very heavy at present, and will not be until the demand becomes sufficient to warrant them being replenished.

Collections are quite normal at the present time, although it has been the experience of some of the manufacturers and jobbers to extend further credit to some of their customers than was usual. This, of course, is accounted for by the general conditions, as the retailer finds it equally as hard to get money from his customers. At the present time, though, it must be said that there has been a great improvement from the first of the year.

Enamelware.

There is a much quieter feeling in the market at the present time than has been experienced for some time back. All lines are moving out slowly, and no immediate change is looked for.

Brass Goods.

The demand has not yet started in for these goods at present, but stocks are quite ample to fill all requirements when the spring trade begins.

Black and Galvanized Pipe.

There is little business passing at present, while stocks are said to be heavy enough to meet with the strongest kind of demand. There should be some movement noted here within the next fortnight.

Pipe Fittings.

The same may be said here. The demand has not commenced, and will not do so before the first of next month.

Soil Pipe and Fittings.

Owing to the small amount of building going on at the present time, there is little or no demand in this market, and jobbers do not look for any for the next three weeks at least.

Lead and Lead Pipe.

The market for lead is firming up a bit after quite a session of easiness. The demand for lead pipe has not shown any change for some time, and the volume of business passing at present does not amount to a great deal. The spring demand has not yet started in, but will in a couple of weeks' time, so there should be some movement then.

Solder.

A quiet market is the report here, with another two to three weeks to go before there is any change looked for. Prices remain unchanged, and range from 23 to 30 cents per pound, according to quality.

The building permits will be coming pretty soon, as plans are reported as being prepared in a good many circles. Until the season opens it will be just a question of guessing, though, as to the amount of work which will be carried on this coming season.

TORONTO.

The month of March is never looked upon as one in which a large volume of business can be expected. There are a few who are reported as busy, but have not their full staff employed; others are fair, none are complaining real slackness for this time. Architects are as busy as can be preparing plans and a good outlook is ahead. There are several large buildings in progress, such as the Royal Bank, the Dominion Bank, The Hugh MacLean Co., the new Technical School, the MacLean Publishing Co., and several other large factory and office buildings, which run into big figures. These will all be ready for the sanitary and heating trades in the matter of a few weeks, except the Technical School and Royal

Bank. On the whole, there is little to complain of.

Enamel Ware.

This commodity is generally the last to be required in the sanitary engineering line, hence, is, if anything, a little slow, though manufacturers feel that it is only a matter of time when their turn will come around. They are, however, working on stock and expect to have even a better year than last.

Brass Goods.

In interviewing several manufacturers of brass goods they seem to feel a slight lull, but if anything, better than last year, and quite a few extensions and additions have been made, one large manufacturing firm have installed upward of \$20,000 worth of new plant recently and have never felt a let up all winter, and what demand there is, is for a better class of goods.

Lead Pipe.

Lead is firm and demands steady; here and there fairly good-sized orders are being received, though on the whole, manufacturers are stocking ready for a break in the weather. The extreme cold spell has caused a steady flow of orders all winter.

Solder (Wiping and Half-and-Half.)

On account of tin being steady, no price changes have taken place of any note since our last issue. There was a slight drop of a $\frac{1}{4}$ of a cent on tin, but was only made to induce sales a little, demands are fair and if anything, greater than last year at this time.

Black and Galvanized Iron Pipe.

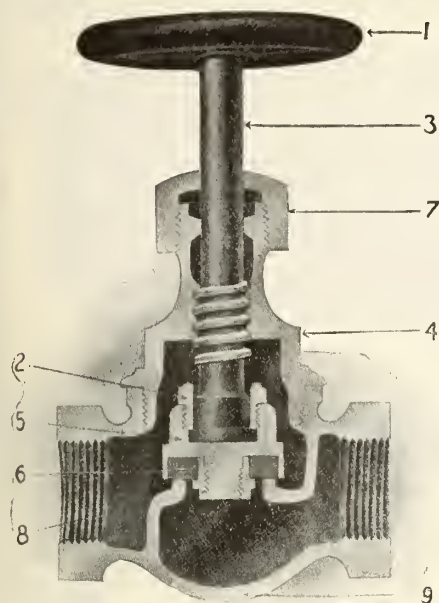
Prices remain unchanged and demands are a little quiet, the general outlook is favorable. Manufacturers are looking forward to a good year and are preparing their stocks accordingly. Fittings, too, are governed by the sale of pipe.

Soil Pipe and Fittings.

This line is improving slightly and foundries are preparing to be able to meet all demands, and while it is expected there will be a bigger demand this year than last, it is felt that Canadian manufacturers will be able to supply all orders.

Collections.

This department is improving as time goes along, and while a little light is better than was expected at this time, considering the conditions which prevailed during the year 1913.



MORRISON J.M.T. VALVES

J. M. T. Valves represent more than the means of merely closing a pipe line. They are designed to fulfill every service a good valve should render.

They have full pipe opening through the valve, offering a minimum resistance to flow. Built with extra heavy and rigid body, enabling them to withstand easily the strains due to the expansion and contraction of the piping. Fitted with renewable "radium" or copper discs and the lock-nut device, No. 8 in the fig., which permits easy removal of the old discs. They are made only of high-grade steam metal, carefully cast and machined to have all parts interchangeable. Each valve is subjected to a severe test at our factory before shipping. We make a J. M. T. Valve or Cock, in brass or iron, for every purpose.



Every valve is stamped with our trade-mark, which is its guarantee of quality.

1, Wheel; 2, Lock-Nut; 3, Spindle; 4, Bonnet; 5, Disc Holder; 6, Disc; 7, Packing Nut; 8, Disc Nut; 9, Body.

The James Morrison Brass Mfg. Co., Ltd.
93-97 Adelaide St. West TORONTO, CAN.

Our Mixed Metal Sales Amount to Over \$5,000,000 Annually



THE RESULT OF QUALITY

Babbitt Metal, Bar Solder, Wire Solder, Lead Pipe, Bar Lead, Traps, Bends, Copper, Tin and Antimony.

Let the goods prove their worthiness of a place in your stock. Send a trial order.

Hoyt Metal Co.,

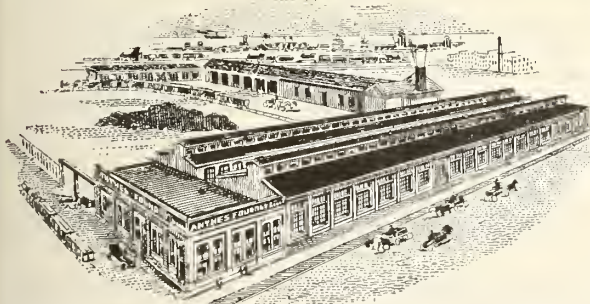
New York, N. Y.; London, Eng.; St. Louis, Mo.

Toronto, Ont.

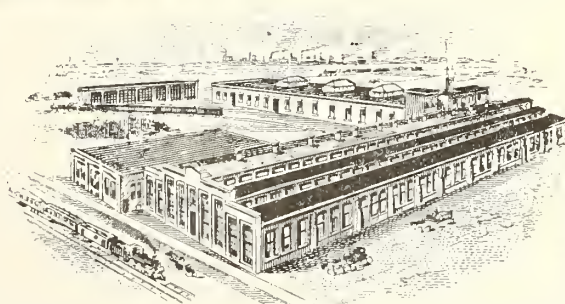
TORONTO

ANTHES FOUNDRY LIMITED

WINNIPEG



MANUFACTURERS
OF
**CAST IRON
SOIL PIPE
AND
FITTINGS**



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LEAD PIPE LEAD WASTE



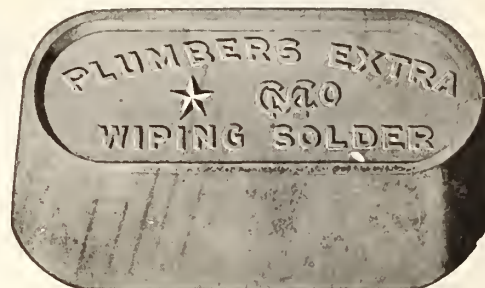
BLOCK TIN PIPE

The Canada Metal Co., Ltd.,

Head Office
and Factory,

TORONTO

PLUMBER'S EXTRA STAR WIPING SOLDER



THE SOLDER WITH THE TIN IN

Branch
Factories MONTREAL, WINNIPEG**WE MANUFACTURE
FOR THE PLUMBER**

Lead Pipe Lead Waste
Hydraulic Drawn Traps
Non-Syphon Centrifugal Cast
Trap (Ask for Cut or Price).
Strictly Bar Solder
Star Extra Wiping (Best on
Earth)
Easy Wiping Solder
Acme Wiping
Brass Ferrules (Select) Tinned
Iron and Lead Combination
Ferrule Bends or Spun End Test
Sheet Lead Lead Fibre

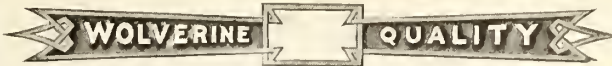
John Wanamaker says that advertising doesn't jerk—it PULLS. He ought to know, and yet some men think that advertising should go against all rules and precedents and jerk them to success with one tremendous yank.

ALPHABETICAL LIST OF ADVERTISERS

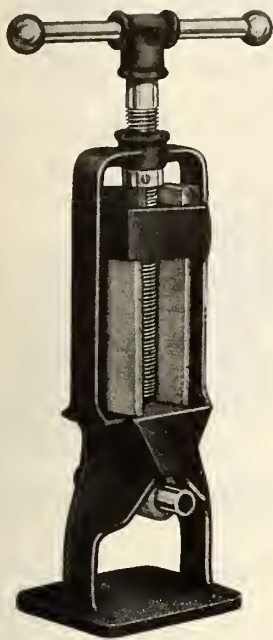
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The index is inserted solely for the convenience of the readers of the paper.

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Fittings, Ltd.	1	Tallman Brass & Metal Co.	4
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Galt Brass Company	Outside Back Cover	Williams, J. H., Co.	30
Gurney Foundry Co.	6		
H			
Hall & Sons, Jno. H.	29		



CAPACITY $\frac{1}{4}$ -INCH
TO 2-INCH I.P. SIZE



**Wolverine
Strap Vise**

Every job done without a mar on the pipe
will increase your prestige



Wolverine Brass Pipe Wrench

JAPANNED HANDLE—POLISHED HEAD.

Patented

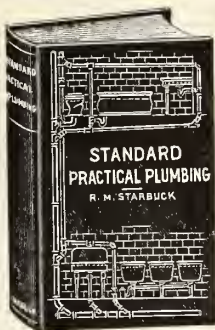
Wolverine Strap Vise holds large or small pipe for threading, cutting or screwing on fittings, etc.

Will not mar the finest surface. Strap is extra heavy and guaranteed to stand the strain and wear.

Wolverine Brass Pipe Wrench has a patent locking device which not only tightens with increased strain, but will instantly release strap when pressure is taken off. Will not mar or crush pipe.

Canadian Wolverine Company, Ltd.

Chatham, Ont.



A WANTABLE BOOK

Standard Practical Plumbing

By R. M. Starbuck

347 SPECIALLY MADE ILLUSTRATIONS

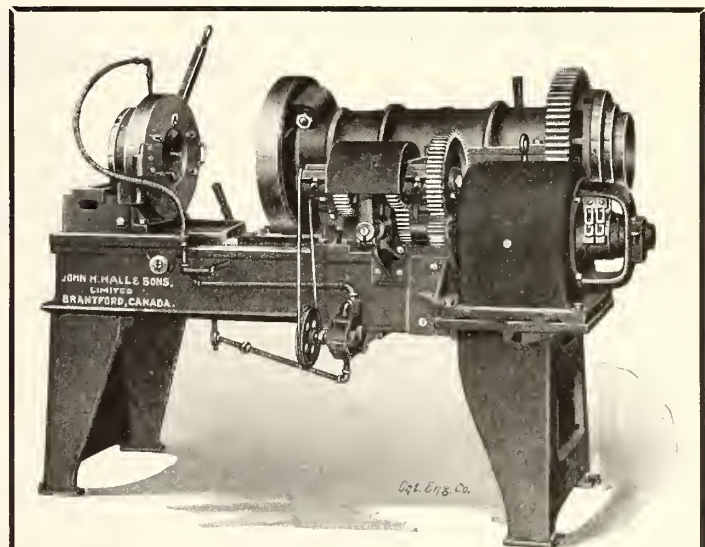
PRICE \$3.00

"Standard Practical Plumbing" is indispensable to the Master Plumber, the Journeyman Plumber, and the Apprentice Plumber. As the book is specially strong in the exhaustive treatment of the skilled work of the plumber, it commends itself at once to every one working in any branch of the plumbing trade. Send for it to-day.

TECHNICAL BOOK DEPARTMENT

MACLEAN PUBLISHING COMPANY

143-149 UNIVERSITY AVENUE - TORONTO



Rear View

This is the popular machine for your work.

The Hall No. 6 Pipe Lathe, fitted either with direct-connected motor, as shown in cut, or with belt drive, capacity $1\frac{1}{2}$ to 6" pipe, with its many improved features, means:

Perfect threads
Rapid production
Quick change of speeds
Convenience to operator
Satisfaction to buyer
Upkeep reduced to a whisper

These machines are Canadian-made and guaranteed in every way possible.

Write us for catalog on other sizes, $\frac{1}{8}$ to 18" capacity, also Roller Pipe Cutters and Double Head Rapid Nipple Machines.

John H. Hall & Sons, Ltd., Brantford, Canada

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

EDUCATION AN INVESTMENT

If you want to secure a sound investment for a few dollars, STUDY SANITARY ENGINEERING or PLUMBING, under the directorship of Prof. Arthur Bateman, who has been a practical teacher for eleven years, in four different institutions, in two countries. Booklet free. Write Desk 5.

ANGLO-AMERICAN SANITARY CORRESPONDENCE COLLEGE

10-12 W. Ontario Street, Chicago, Ill.

SYPHONS FOR SEPTIC TANKS

Alex. I. Mearns
93 St. Genevieve Street, Montreal

READERS

The Editor wishes every one interested in

Domestic Sanitary Heating and Ventilating Engineering

to make use of this paper. Any article or problem of interest, any topic of note will be used if any such has a tendency to uplift the Trade.

Every local or provincial association can use this paper free of charge to make other members acquainted with the business done and benefits derived from being an organized body.

Condensed or "Want" Ads.

FOR SALE

FIRST-CLASS PLUMBING AND PUMP business in a town about 2,000, doing a good trade, water works just installed last summer and a good business is being done. An A1 business for a first-class plumber, stock about \$800.00. Good reasons for selling. Address Box 73, Fergus, Ont. (9)

CANADIAN PATENT AND UNITED STATES rights for same, covering valuable invention for steam radiator providing positive control, also connecting valve for sale. Cash or Royalty basis. Reasonable. Particulars, address Box 81, Sanitary Engineer, Toronto. (5)

FIRST-CLASS PLUMBING AND PUMP business in a town about 2,000, doing a good trade, water works just installed last summer and a good business is being done. An A1 business for a first-class plumber, stock about \$800.00. Good reasons for selling. Address Box 73, Fergus, Ont. (4tf)

CANADIAN PATENT FOR FLUSHING Valve for sale, cash or royalty. We believe more of our valves were used in Greater New York 1912-1913 than any six other makes combined. Address, Flushovalve Co., 536 Broome, New York. (5)

PLUMBING — THIS IS A WELL-ESTABLISHED business in a very good location. Fine opportunity for a practical plumber. Will sell very reasonable, as have other interests. If you are looking for a location and a bargain write and will send you full particulars. Charles Geiser, Saskatoon, Sask. (7)

BUSINESS CHANCE

PLUMBER & STEAMFITTER—SPLENDID chance for ambitious man with about \$500.00 cash or security. Well-established business, just outside Toronto. Good reasons for selling. Apply 118 King Street East, upstairs. (6)

SECRETARY WANTED

APPLICATIONS WILL BE RECEIVED FOR the position of secretary for the Ontario Society of Domestic Sanitary and Heating Engineers. A middle-aged, clerical person preferred. Box 76, Sanitary Engineer, Toronto.



GENUINE ARMSTRONG STOCKS and DIES

FOR THREADING PIPE OR BOLTS
KNOWN, USED,
COMMENDED EVERYWHERE

PIPE MACHINES,
both Hand or Power
HINGED PIPE VISES
PIPE CUTTERS
PIPE WRENCHES

RATCHET ATTACHMENTS
BARD ADJUSTABLE
BUSHINGS

Manufactured by

THE ARMSTRONG M'F'G. CO.

317 Knowlton St.
BRIDGEPORT, CONN., U.S.A.
NEW YORK CHICAGO

WRITE FOR CATALOG

"Agrippa"

Chain Wrenches



Universal for Pipe and Fittings

A life may depend upon or an injury may result from the use of most tools. "AGRIPPA" Chain Pipe Wrenches are tested and proved dependable before they reach you. This practice is unknown elsewhere—every weakness is eliminated.

"AGRIPPA" Wrenches will do all of your pipe and fittings work and are guaranteed to do it without a failure—and at the minimum of cost.



Show us a plug which a Williams Waste Plug Spanner will not fit.

J.H. Williams & Co.

Superior Drop-forged Tools

77 Richards St., Brooklyn, N.Y. City
40 So. Clinton St., Chicago, Ill.



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Canada Metal Co., Toronto.

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Tallman Brass & Metal Co., Hamilton.
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Brass Goods, Valves, Etc.
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Wallaceburg Brass Mfg. Co., Wallaceburg, Ont.
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Hall & Sons, Ltd., Brantford.

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Galt Brass Co., Galt.
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Reducing Pressure Valves.
C. A. Dunham & Co., Ltd., Toronto.

Steam Specialties.
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Use a MUELLER Pipe End Reamer

"MADE IN CANADA"

It will give back the full pipe area which is greatly reduced by the cutting operation.

A big, strong, powerful tool that will ream burrs from pipe $\frac{3}{8}$ to 3"—a few twists of the ratchet handle is all that is necessary.

Good tool steel blades, easily kept sharp,—you ought not to be without this tool—you never will be after you try it.

In use everywhere. It is Unconditionally Guaranteed.

Mueller Plumbing tools of all kinds are the best. We make all kinds of plumbing brass goods, water and gas goods. Ask us about them.

H. Mueller Mfg. Co., Ltd.
SARNIA, ONTARIO

S. E.

H. Mueller
Mfg. Co., Ltd.,
Sarnia, Ont.

Gentlemen:—

Give me full information and prices on Pipe End Reamers.

Name

Address

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

It's not only a matter of Pride

in your work, but a consideration of your own individual efficiency, that should lead you to seek the neatest and quickest way of handling any particular job.

Take pipe-cutting, for instance. If you use one of those wheel cutters, you may be able to separate a length of pipe into two pieces with it; but the ends will be uneven and burred, perhaps split, and it will need a lot of filing and reaming to make them fit for threading and roughing in. On the other hand, if you had used a

Beaver Square End Cutter

you would have separated your pipe more quickly, more efficiently—with less effort to yourself; and the ends would have been dead square, without burrs, inside or out, and with never the sign of a split.

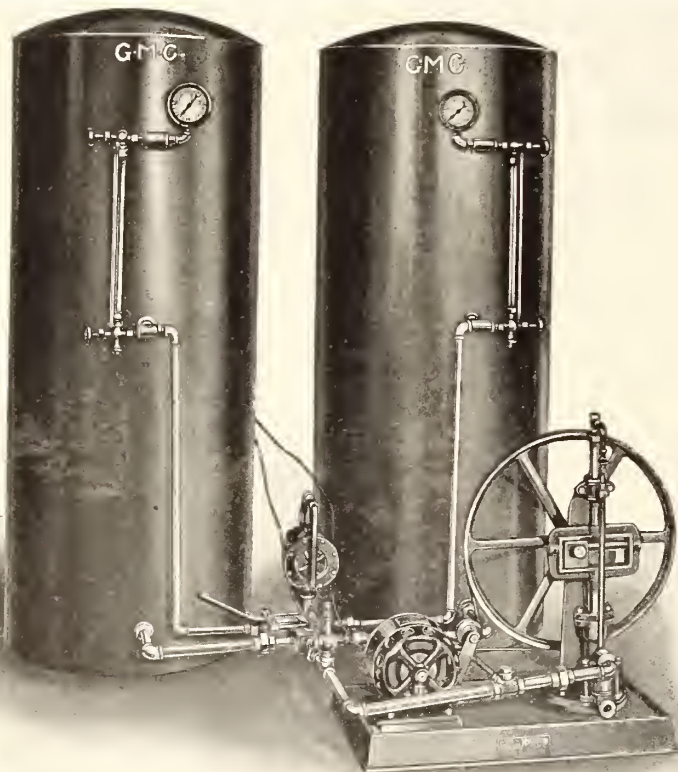
The Beaver would have done the job easier, and would have saved you the filing and reaming as well.

Besides, it is automatic feeding—you just close it in on the pipe—it does the rest; and the knives are very easily sharpened when dull.

You want to try cutting pipe with it—and then you'll get wise!

It's waiting at your dealer's for the experiment.

BORDEN-CANADIAN COMPANY, Toronto, Ontario



THE ONLY ABSOLUTELY SAFE DOUBLE AUTOMATIC PRESSURE SYSTEM

G.M.C. Water Systems

The "G.M.C. Special"

Combination Hard and Soft
Water System

SAFETY FIRST

The G.M.C. interlocking safety device provides absolute safety. The movement of one handle directs the discharge from the pump into the tank desired. At the same time the Automatic Control is switched to that tank, thus protecting the system from excessive pressure.

One handle does the work of four valves and does it right.

The General Machinery Co., Ltd.,

22 Mulock Avenue, Toronto

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

DART UNIONS

*form a pipe joint that defies time, pressure, corrosion,
vibration, expansion and contraction*



Use the Dart on all pipe work and you'll save time and give satisfaction.

All Dart Unions have the trade-mark as shown on the cut. We will promptly replace two for one any Dart Union that is found defective.

Jobbers from coast to coast sell them.

Dart Union Co., Ltd., Toronto, Ont.

**BRONZE to BRONZE
at the joint**

KERR GATE VALVES

OUTSIDE SCREW AND YOKE

"KEYSTONE" PATTERN

Embody all the latest features



4 1/2-in. and larger

Screwed-in Seats

Deep Bronze
Bushed Gland
and Stuffing
Boxes.

Full Opening.

Large Diameter
Hand-Wheels.

Solid Wedge
Discs.



4-in. and smaller

Narrow face-to-
face Dimensions

Symmetrical
Design.

Good Material.

Interchangeable
Parts.

Guaranteed
Tested.



4 1/2-in. and larger

The Kerr Engine Co., Limited, MANUFACTURERS
Walkerville, Ontario

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

"RAPIDO" (RAPID OPENING) SINK BIBB

ALL OUR
BRASS-WORK
"ABSOLUTELY
GUARANTEED"



CONICAL
PACKING

FOUR
FULL THREADS
ON STEM

ENCASED
WASHER

RAISED
SEAT

BRIGGS'
STANDARD
THREAD

ANTI-
SPLASHER

SET SCREW FLANGE

Manufactured only by

GALT BRASS CO., LIMITED GALT,
CANADA

Have you received our new Catalogue on

EMPIRE CLOSETS?

If not, write us at once—you cannot afford to be without one. We show a complete line of tanks, seats and flush valves in various combinations, which makes it an invaluable assistance in selling your customer.

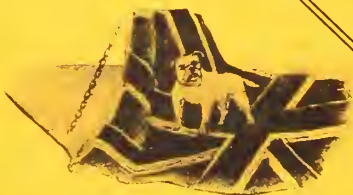
FILL OUT THE COUPON TO-DAY.

Empire Mfg. Co., Limited

Head Office and Factory:
London, - Canada

Montreal Office:
Room 31, C.P.R. Telegraph Bldg.

Winnipeg Office:
109 Carlton Block,
Portage Ave.



Empire Mfg. Co., Ltd.,
London, Canada.
Please send me your new catalog and
prices on Empire Closets?
Name
City
Prov.

THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

Publication Office : TORONTO, APRIL 1, 1914

No. 7

ENAMELED
ALL-OVER

Victor BATH
ONE-PIECE

ENAMELED
INSIDE



The principle of the Victor Bath is a tub body cast integral with a Base and Wing Plates; the latter in various positions on the Tub Body to make the various Combinations, viz.:



Open Type
Corner Type
Recess Type
End to Wall Type
Back to Wall Type
Also with Extension
Rim at End or Back
for fittings—thru Rim

Catalogue and Prices on Request.

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

TORONTO
119 King St. East

MONTREAL
42-44 Beaver Hall Hill

WINNIPEG
76-82 Lombard St.

VANCOUVER
410 Carter Cotton Bldg.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

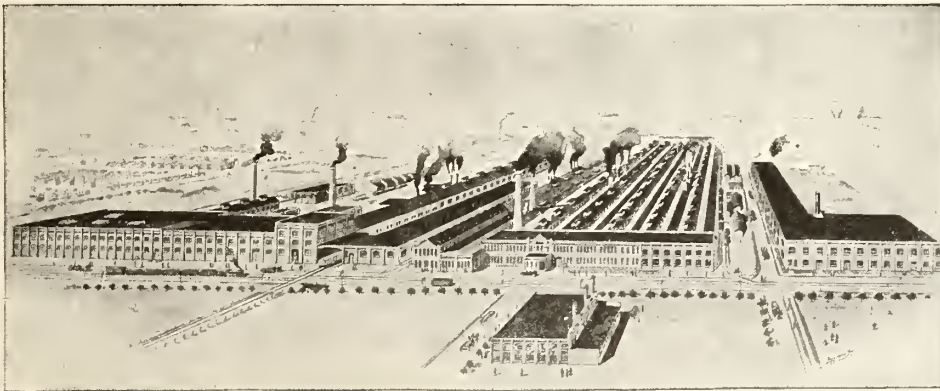
General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co.,
178 Victoria St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes,
120 Lombard St., Winnipeg

BRITISH COLUMBIA:
A. O. Campbell,
864 Cambie St., Vancouver



GENERAL OFFICES AND WORKS:

FITTINGS LIMITED, OSHAWA, CANADA

WAREROOMS:

MONTREAL

WINNIPEG

VANCOUVER

CATALOG FURNISHED UPON REQUEST



"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

“Standard Sanitary” Plumbing Fixtures



“Standard Sanitary” Bathroom of Queen Victoria of Spain.

The above cut was made from a photograph of the fixtures actually installed in the Royal Palace of La Magdalena, Santander, Spain, the summer residence of their Majesties, the King and Queen of Spain.

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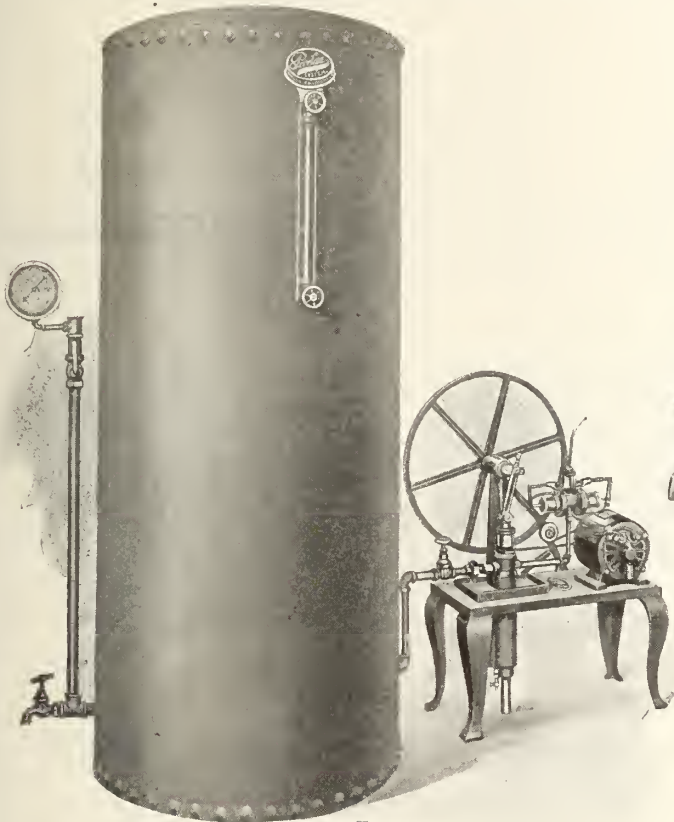
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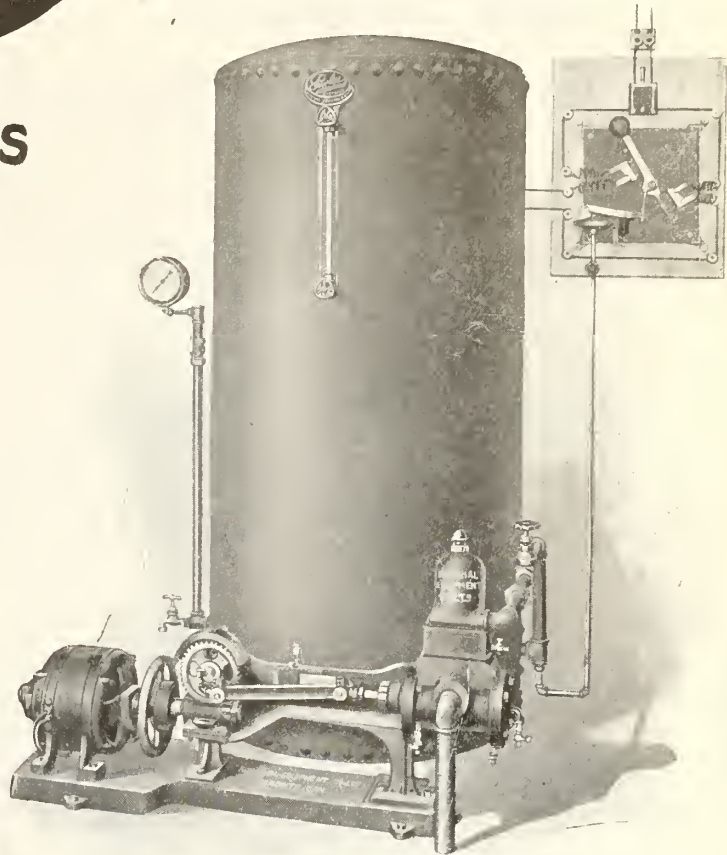
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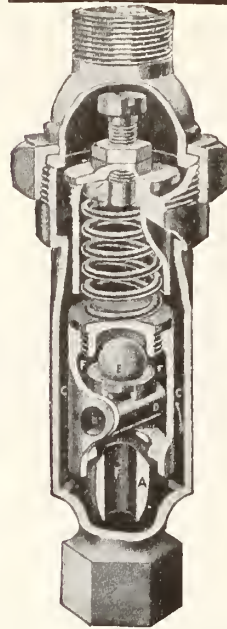
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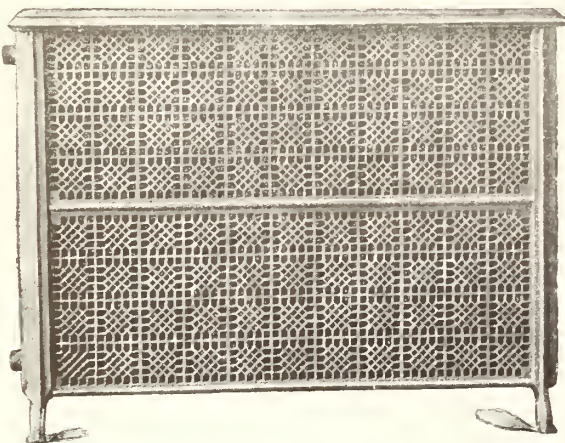
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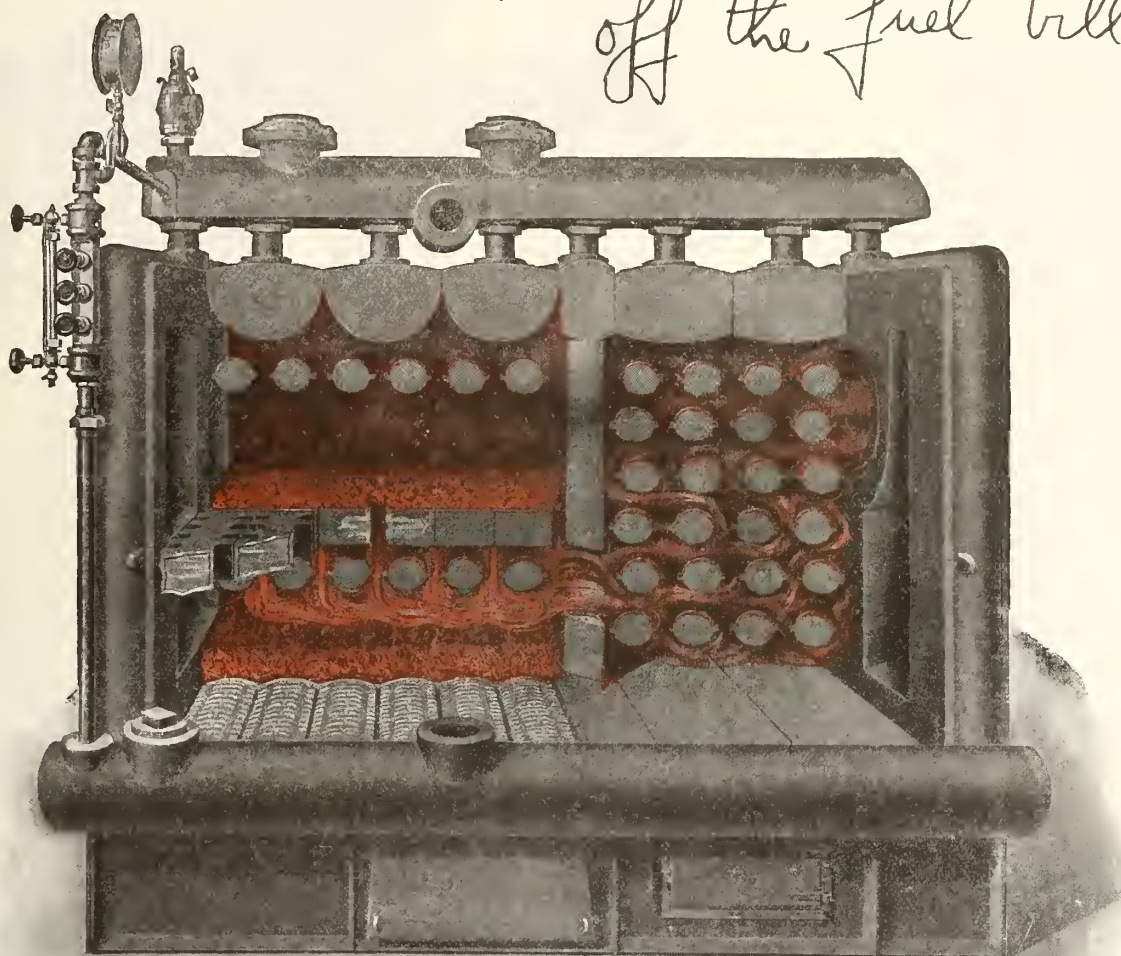
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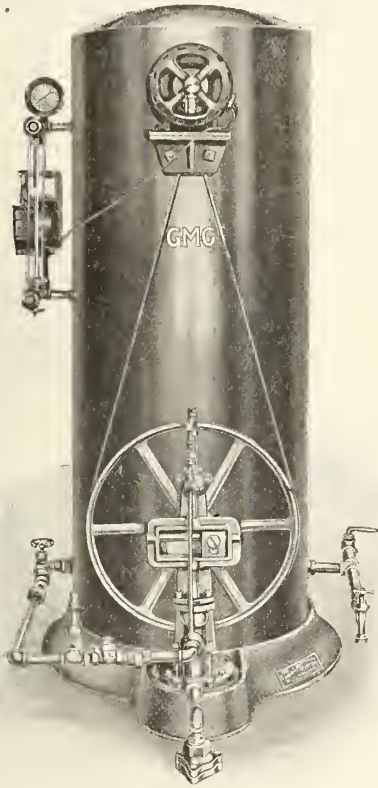


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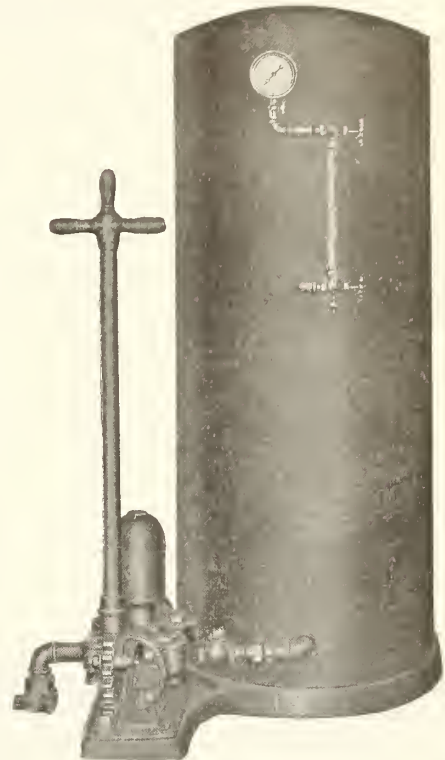
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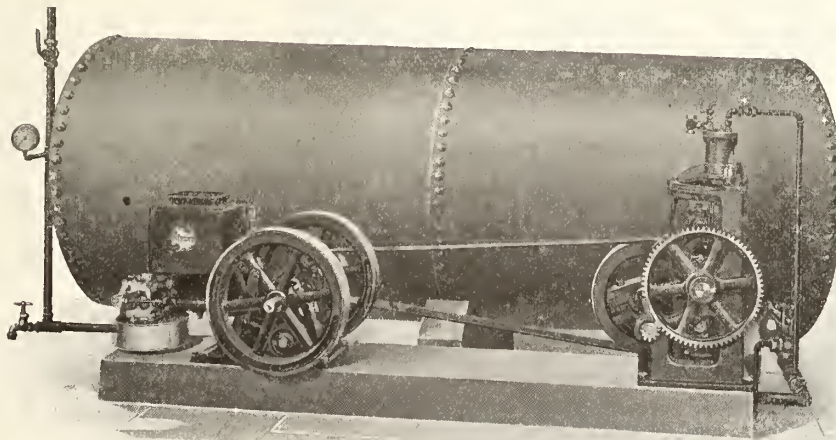
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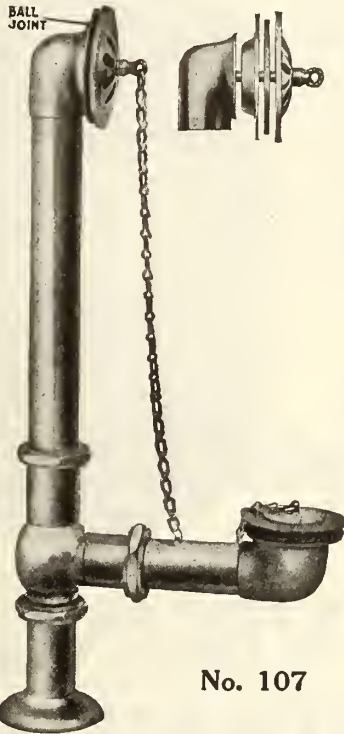
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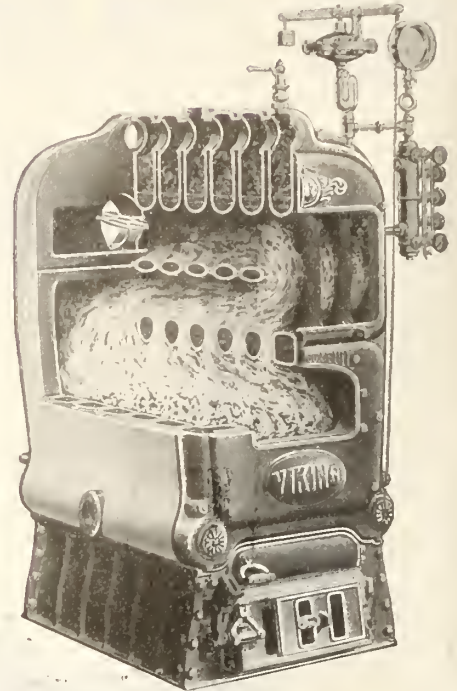


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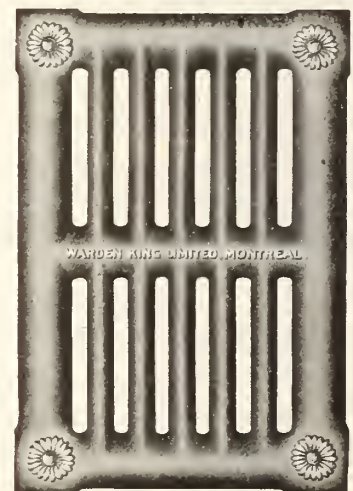
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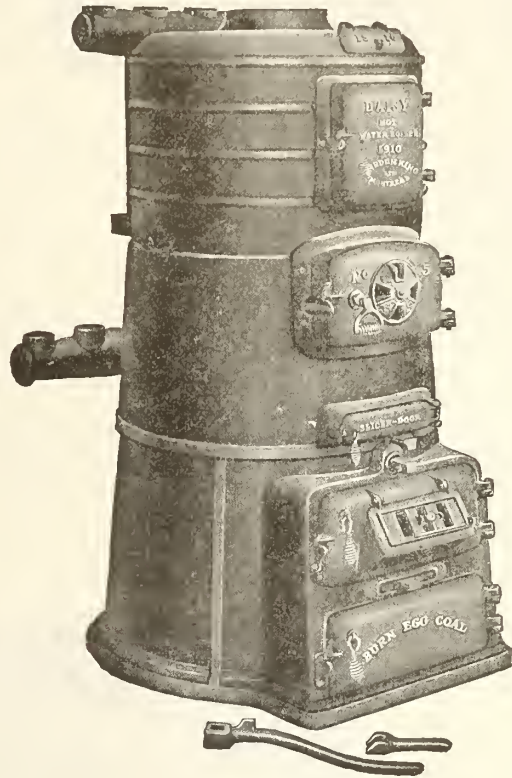
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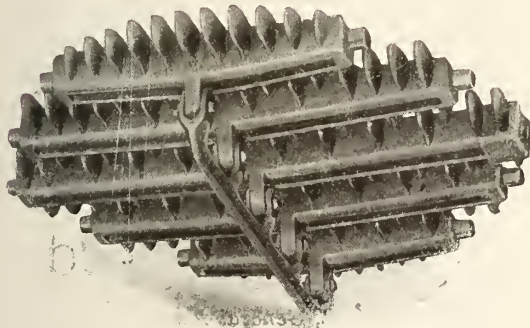
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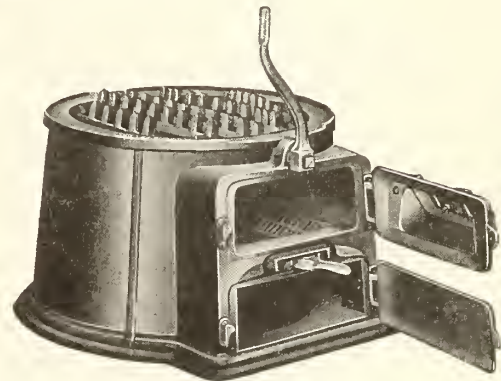
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SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, APRIL 1, 1914

No. 7

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A new tank will be given to replace one that at any time proves defective from either material or workmanship.

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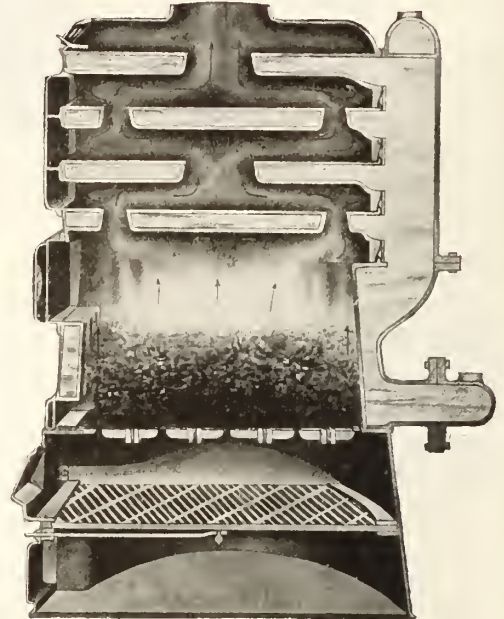
A Hot Water Boiler That Is Standing The Test.

"KING" Boilers carry our unqualified guarantee.

Mr. Heating Engineer,—

Isn't it worth something to deal with a house that has faith in its product and will stand behind the goods they manufacture?

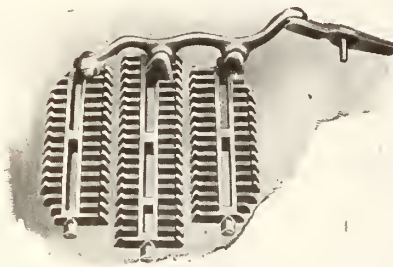
The talking points on a "KING" Boiler are numerous, in fact too numerous for us to attempt to explain them in this limited space. A few of them need no explanation and are shown in the accompanying cuts.



Sectional View of "KING" Boiler, Showing Improved Design of Waterways, Combustion Chamber and Fire Travel.

"SPECIAL FEATURES"

The large one-piece ashpit.
The special shaking grates and convenient shaking arrangement.
The fire-pot with a real corrugation.
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The double shaker.



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The perfect fit doors.
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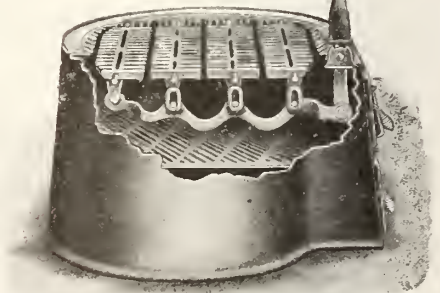


"KING" Fire-Pot, Showing Wide Corrugation, Adding One-third to Heating Capacity.

Investigate for Yourself.

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THE SANITARY ENGINEER

VOL. VIII.

APRIL 1, 1914.

No. 7

A Discussion on Simplified Plumbing

Showing Where a National Plumbing Code Would Be a Boon to the Craft, As Well As of Assistance to the Progress of Sanitary Engineering.

SIMPLIFIED PLUMBING.

FOR several years, those engaged in sanitary engineering have from time to time expressed the opinion that a uniform code of by-laws should be in force governing sanitary engineering in all parts of the Dominion of Canada. No doubt such a set of by-laws would be a boon and if each town or city in the various provinces would take this subject up in a serious manner, then each would be, as it were, subscribing their little towards such an end.

One thing should never be lost sight of when compiling such by-laws and that is, to make each and every clause or section as clear and definite as possible. Another is to steer clear of all complicated systems of piping. At this day we are being cursed with too much imaginary precaution. The practice of so much unnecessary venting and re-venting of traps has become too much of a rule of thumb. Many city plumbing by-laws demand that every trap, no matter what make, shall be back-vented, and in thousands of cases, such a demand is altogether ridiculous. Just imagine a large building with as many as ten separate W.C.'s on a top floor, all of which are connected to separate soil pipe stacks, with no other fixtures above them; no condition ever justified the venting of a w.c. lead bend when located within 20 inches from soil pipe stack. In a single house with one bathroom, where the w.c. is 20 in. or less from the stack and is the highest fixture, there is no reason for demanding that it be back vented except when other fixtures are allowed to waste into the lead bend, though in no case should that be allowed.

Then there are various styles of traps which resist syphonic action better than others when placed direct into a stack and only a short distance away from the stack. These and scores of other instances only go to prove that our by-laws should be changed in more ways than one.

Another fixture which should be given more consideration is that of the laundry tub. These are often left out of the fixtures in a middle-class house, because

of the extra cost, the biggest expense being the cost of installation. This should not be the case. Why should they be connected to the drain at all? There is no reason for such being necessary; in fact, actual proofs show the contrary.

These fixtures are generally only used once a week, and before a week has transpired the water in the traps has all evaporated and seal broken. Why not have a catch basin and a deep seal cast-iron floor-trap? The catch basin should be fitted with a bell trap, too, as a safeguard. We herewith show a plan of our suggestion:

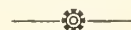
There should be more attention given to the subject of main house traps than there is at present, the breather should not be insisted upon under every condition. There are conditions where such a pipe does not act as one and therefore should not be enforced. If more practical knowledge was brought to bear upon this question of breathers, there would be less of them. There are, of course, conditions where they are necessary, but not in all cases.

It seems absurd to see these breathers enforced under every condition in some cities and in others only a few miles distant they are never seen.

The soil pipe terminals are of greater importance than many are apt to believe, and except where the climate is very cold in winter, little or no care is given to them. It is a very common sight to see these terminals towering 15 to 20 feet up in the air, and being used to carry telephone or electric wires. There is no necessity to install them in such a way, and a terminal such a length cannot be of much use in winter time anywhere in Canada.

There is another very important matter which should be taken up which is not really a construction matter, viz:—No excreta from a person afflicted with any infectious disease should be allowed to enter the public sewers and particularly when most of our towns and cities are allowing the sewage to empty into our lakes, rivers and streams, though we are hoping to see the day when each and every town and city will have prop-

er sewage disposal plants. Even then, the sewers should be guarded to some extent.



SUGGESTIONS AS TO SEWAGE TREATMENT.

As a guide to authorities engaged in the preparation of schemes of sewage treatment for the municipalities of Saskatchewan, Dr. M. M. Seymour, commissioner of public health, has issued an important bulletin. The bulletin was prepared by R. H. Murray, provincial sanitary engineer.

While suggestions of a specific kind are given in the course of the circular, it is pointed out that sewage treatment work designed at variance with the plan laid down may be approved by the commissioner of public health, and conversely that works designed in accordance with the suggestions may not be approved of. Modifications may be necessary to meet local conditions, and the decision of the bureau will be based upon a thorough study of all the requirements of each locality.

The information provided in the bulletin is largely of a technical character, but to engineers and municipal authorities upon whom the task of preparing sewage treatment systems devolves, it will be of vital interest.

Where sewage is to be pumped, the bureau suggests that provision should be made for screening, for cleaning screens at frequent intervals, and for removing and disposing of screenings. Where works are of a character producing a large quantity of screenings, mechanical means for their removal should be provided.

Further suggestions are made under the captions of "grit chambers," "sedimentations," "sludge storage," "humus settling tanks," "disinfection," "effluent pipe," "housing of tanks and beds," "laboratory," and the laying out of grounds surrounding treatment plants. The manner in which biological filtration should be carried out is dealt with at length.

Should Sanitary Engineers Advertise and How?

Showing That While Newspaper Advertising May Bring Some Good Results, It Is Felt That Giving Good Service and Attention to Customers' Requirements Is Far More Satisfactory.

IF there is one branch of the sanitary and heating engineer's business which is neglected, it is the advertising end. In conversation with one of the members of the craft, the writer was asked what method of advertising this trade should adopt. Well, no doubt good results would be obtained by careful newspaper advertising, but before initiating such a policy the sanitary engineer must be ready to live up to all the statements made in his advertisements; the goods he installs must be of unquestionable quality; his men must be of the highest order, and he himself must see that his advertisements are lived up to in every sense of the word.

This profession is one which in the main requires a personal method of advertising. Let us suppose, for instance, that a well-advertised play is visiting your town. From the posters, play-bills, etc., you get the impression that the performance must be a most interesting one and you have practically decided to pay it a visit. Then by chance you hear a conversation between two of your friends: "Well, John," says one, "I hear you went to the play last night. How did you like it?" To which John replies: "Simply rotten, never so much disappointed in my life. I wouldn't go across the street to see it again." The chances are that with such a recommendation as this in your mind you decide to forego your proposed visit. Had the play been all that could be desired, just the reverse would have been the case. In the same way, it requires more than paper advertising to insure success in business.

To start in this line of business a man must possess at least three qualifications:

- 1st. A thorough mechanical knowledge.
- 2nd. A commercial knowledge.
- 3rd. A thorough conviction of the necessity of giving a square deal both to his customer, his employee and himself.

a feeling in his heart that failing to carry out every one of these convictions will eventually result in failure, either morally or financially. One of the best assets a man can have in the sanitary and heating business is a number of loyal customers, and one cannot acquire such a class of patrons unless he is loyal to his employees. Employees never fail to show their respect for an employer, who is inoculated with the spirit of a square deal. One big fault

the average employer has is that he does not discuss the various pros and cons of business with his employees. Of course, we must admit there are different phases of one's business which cannot well be laid bare, but where constructional or mechanical problems are concerned, where the various temperaments of customers have to be dealt with, etc., such can be easily taken up with one's employees. The journeyman should be shown that it is to the mutual benefit of all parties that every customer should be given fair value for money, and when an employer sees a journeyman is neither capable nor willing to give such equitable service his services should be dispensed with, and he should be told the reason, in as fair a way as possible. No amount of bullying ever made a good mechanic and never will. Then, again, there is the ability of handling men to be considered. Many cases could be cited where men have left one employer owing to their apparent inability to do a good job and have gone to another employer who is in the habit of studying the various qualifications of his men and of giving them work according to their several abilities. In that way he gets the best results, not only for himself, but also for his customer, and in that way makes his customer a friend and living medium of advertising.

Therefore we believe the best medium for advertising for the sanitary and heating engineer, is the satisfied customer, and we would urge upon every member of the craft to try his best to acquire all the customers he can by giving a square deal, and by reasoning with them and showing that low-priced jobs have never been cheap in the long run. Every customer will thus be willing to pay for all he receives, both advice and service, and the man who is served by satisfied and loyal employees, is bound to find them a profitable asset. In conclusion, let us quote a well-known writer who, when speaking upon this subject said:

The principal ingredients that go to make up success in any business are as follows:

1. Strict honesty with your customer, competitor, banker, those who assist you, meaning labor, and in fact all things, especially with yourself.

2. A thorough knowledge of your busi-

ness, both mechanically and commercially.

3. An efficient equipment and an efficient force to handle the equipment.

4. A knowledge of your costs sufficient at least to know whether you are making a fair profit on your products.

5. Careful study of your overhead expenses to see that you do not overload your productive capacity by complicated book-keeping or methods of obtaining work.

6. Make your customer a salesman for your business. This he is always willing to become if you treat him right and give him good service. It is easier to keep business than to get new business. Strain every effort in reason to please the customer.

7. Have satisfied, competent help, and see that they are supplied with abundance of material; it is cheaper than labor.

8. Be careful that every step or movement is shortened to the uttermost, and that the hygiene of the workrooms is as good as it is possible to make it. Then if the returns show that it can be done, let the producer share with the results. In fact, the whole establishment should be run on the family basis, "One for all and all for one." With these, I might add that constant watchfulness and thought with unity of action must bring success.—Charles Francis.



TORONTO SOCIETY OF SANITARY AND HEATING ENGINEERS TO SUPPLY PLUMBING EQUIPMENT.

Complete equipment for the plumbing laboratory in the new Technical School, consisting of a bath, basin, sink, and all other fixtures in common use, will be installed in the school by the Toronto Society of Domestic Sanitary and Heating Engineers, without cost to the department, a letter to the effect that the society desires to make this gift having been received from Dr. McKay, principal of the school. The equipment is intended to supply the senior classes in plumbing with a practical knowledge of all modern sanitary equipment and the method of installing it. The letter was presented to the Advisory Industrial Committee yesterday, and the offer was accepted with alacrity, the members expressing much appreciation of the gift.



W. H. WIGGS.

A Message to Young Businessmen

By W. H. Wiggs, President Mechanics' Supply Co., Quebec

"Seest thou a man diligent in business, he shall stand before kings; he shall not stand before mean men."
 'Tis not in mortals to command success,
 But we'll do more—Sempronius,
 We'll deserve it."

THIS article is written with the hope that it may help many of the youths of this great country to solve the problem of how to attain a successful business career. The boy or young man starting in life has but one supreme thing to offer to the world, and that is his own Personality. His father's influence or position may help him a little, perhaps, at the beginning, but other qualifications can either make or mar that influence. First then as regards his Age. If he has chosen a business or mechanical profession he should not be younger than seventeen or eighteen. Previous to that he requires all the education and development of the mind he can attain. This is of incalculable value, its loss is almost irreparable in after-life. Once a good education is obtained, it can never be lost. It is a continuous and growing asset. The three R's—"Reading, wRiting and aRithmetic" are still the greatest factors in a good common-sense, every-day education, and form the corner stone of many a successful business career. The wisest of men has said, "Get understanding, the merchandise of it is better than silver and the gain thereof than fine gold." If impossible (and don't let the boy have his own way in this) to remain at school till that age, do not lose the first opportunity to

attend a night school. Even after leaving school it is well for the young man who desires to improve to attend a mechanical, drawing or educational class relative to the vacation he has chosen.

This leads us to the Choice. What shall I do with my boy? is an anxious question to many a parent. In this it is well to allow him to think the matter out for himself. Let him early learn to use his own initiative. Offer, however, your mature advice and endeavor to cultivate an ambition or inspiration in his mind. That should he choose to enter a Railroad office to become its President, should it be as a salesman, bank or office clerk to become the Manager, should it be as a mechanic, to be the best in the shop. "You cannot steer a boat that has no headway on." Do not be a creature of circumstances. Have an object in life and concentrate all your energies to attain it. Discover your purpose. Throw your life into it, endeavor to be somebody, with all your might. If everything does not come your way at once, do not rush off to new fields. The young athlete who has absorbed into his very being the goal, and all that it comprises and requires, feels already the laurel crown upon his brow. Emerson has said, "If a man can write a better book, preach a better sermon, or make a better mouse-trap than his neighbor, though he build his house in the woods, the world will make a beaten track to his door."

After the choice has been made, what are the stepping-stones that point the way to ultimate success? The first is Character. Again the wise man has said: "A good name is to be chosen rather than great riches." A name kept unsullied adds day by day to its lustre and worth. The basis of character is Habit. Cultivate, then, early in life, to do right, to exercise daily all the God-given attributes of our higher nature that go to build up a strong and vigorous manhood. "Every day is a little life and our whole life is a day repeated." Cultivate early the habit to think and act for yourself and thus obtain initiative ability which by daily usage is so increasingly strengthened that it finally attains its end. Cultivate also your physical, moral and intellectual side, learn to value time and money, and spend neither foolishly. It is needless to add that per contra slipshod thinking, carelessness in observation and reading, lack of physical exercise and regular hours, religious indifference, laziness, thoughtlessness, all help to undermine the super-structure of character.

The next stepping-stone is Perseverance. It is a conquering faculty, he alone triumphs who repeatedly makes use of it. Difficulties and temptations vanish under its influence. Reliability and trustworthiness are its handmaidens. Per contra, how many choose the easier way and yield to the tired feeling, to wasting time, to neglecting study on improvement of the mind, abandoning the desire for the higher life, forgetting that all this tends to form a puny weakling of but little use to himself or his surroundings. Master, then, by perseverance, the hard things in life, be thorough in little as well as big things. Subdue your lower nature and feel the joy of deliverance in this and of ultimate victory in all things. The world yields to such a spirit as this and recognizes its master.

"Persist if thou would'st truly reach thine ends,
 For failures oft are but advising friends."

A third stepping-stone is Courtesy. Be a gentleman; you owe it to yourself and community. Disabuse your mind of the false idea that to be a gentleman your father's name must commence with a Van or finish with Esquire, or that his wife's name was Vere de Vere, or that you live in Portland Place and wear kid gloves, patent leather shoes and carry a cane, or that you can drink a glass of whiskey and soda or smoke a 25-cent cigar, and say "Damn it" in every sentence. None of these are the ear-marks of a gentleman. Cultivate higher ideals than these.

"To thine own self be true, and it must follow, as the night the day, thou can'st not then be false to any man." Learn to be courteous and respectful to all, your superiors, your equals, your inferiors. Your treatment of the latter is generally the keynote to the former. Respect old and mature age, ladies and children. Practise this at home, and the habit there formed can be accelerated abroad. Be willing to take a secondary place, not always looking to get the advantage. Meet the world with a smile. Abhor underhand, mean or spiteful actions. Play the game fair. Another author writes: "Be agreeable, not intimate; pleasant, not offensive; open to instruction, not conceited; truthful under all conditions, and careful of your speech; make no promises which cannot be fulfilled."

Emerson says: "Give a boy address and accomplishments and you give him the mastery of palaces and fortunes. Wherever he goes he has not the trouble of earning or owing them, they select him to enter and possess."

Another and very important stepping-stone is Companionship. The influence of a good or bad companion will either make or mar your progress in life. Every boy of health and spirit has his friends. They are of two kinds, the helpful and the hurtful. When we older men look back over life's pathway, we can easily pick out those that have helped us along. Discriminate at the outset and by a manly independence, backed by your own convictions and aspirations,

assume the leadership. Pullman wrote: "Never say it is nobody's business but my own what I do with my life." It is not true. Your life is put into your hand as a trust for many and others beside yourself. If you use it well it will make others happy; if you abuse it, it will harm many others beside yourself."

Then, too, the choice of Amusements has much to do with companionship; both are leading factors in our lives. A few words as regards the former: Amusements can be readily divided into two classes, those which give diversion with rest to the mind and body, and those that give diversion with waste of mind and body. The first are wholesome, healthy and necessary; the second enervating, unhealthy and exhausting. In addition to your outdoor amusements, cultivate some hobby, such as music, drawing, photography, collection of minerals, of stamps or postcards, of coins, or anything to which you take a special inclination. Add to this Travel. See as much of this beautiful world as you can. Nothing so develops the mind and broadens the mental horizon. It is an unending source of pleasure and conversation. The money expended this way will more than offset the expenditure of time and money on theatres, cards, billiards, wine, cigars and such like. Don't, therefore, allow your amusements and companions to be a matter of chance or indifference, their influence is of too vital an importance in our lives not to give them the wisest consideration. Connecting all the stepping-stones together is Ambition. The world is spread out before you. Every occupation or position you can think of will some day be vacant. Who will refill them? The higher you ascend in life's scale the more room you will find at the top. But the world has no bargain-counter for these positions, they are only offered to those who can and have paid the price by a judicious use of the stepping-stones already alluded to. Competition for these positions is not severe, nor is there a crowd to elbow aside. It is not luck that bestows them.

"There is no chance; no destiny; no fate,
Can circumvent, or hinder or control
The firm resolve of a determined soul."

Good or bad fortune has nothing to do with it. Only the persistent converging of the characteristics heretofore alluded to will act in our lives as beacon-lights to the world around us.

"An institution is the lengthened shadow of one man." So will that shadow deepen in proportion to the light shed. The weakest living creature by concentrating his powers can accomplish something, whereas the strongest by dispensing his over-many may fail to accomplish anything. For the man who understands that success is simply doing one thing well, the way is clear and the end sure.

Emerson has said: "Greatness always appeals to the future. The force of character is cumulative. All the foregone days of virtue, work their health into this. What makes the majesty of the heroes of the Senate and the Field which so fills the imagination? The consciousness of a train of great days of victories behind."

"To every toiler, he alone is great
Who by a life heroic, conquers fate."

Underlying ambition is the great factor of concentration. Learn to do one thing well. Apply this first to yourself and then to your occupation. Carlyle has said, "To redeem a world sunk in dishonesty has not been given thee solely, over one man therein thou hast quite absolute uncontrollable power; him redeem, him make honest; it will be something, it will be much, and thy life and labor not in vain." Mind your own business, and again, mind your own business. A man of note states that no advantage results from telling one's business to others except to create jealousy or competition when we are fortunate, and to gratify our enemies when otherwise. Especially keep your business engagements as a private and sacred trust, and in like manner don't talk about your employer's affairs. And here comes in the question of Salary. The word salary is from the Latin "Sal," meaning Salt, hence the saying: "Not worth his Salt." Beware of coming under this category. Yet it is in your own hands, you alone make your worth, not your employer, by giving him increased value in time, energy, respect and such abilities as you command. The more you can offer the greater your value. Keep scrupulously to your bargains. When you make a bargain to work eight hours a day for \$10 a week, don't give seven hours and a half. Is it honest to accept the pay envelope at the end of the week under these conditions? and what effrontery to expect an increase in salary at the end of the year!

Don't you think you should give your employer as much fair play as you expect from him?

Elbert Hubbard has said: "If you work for a man, in heaven's name work for him. If he pays you wages that supply your bread and butter, work for him, speak well of him, think well of him, stand by him, and by the institution he represents." Be alert—ready to go wherever asked. Don't ask useless questions—find out for yourself. If you know of an improvement in your employer's business, suggest it. Do things without being told, relying on your judgment, which can only develop by such usage. Take the initiative and be a leader, not a hanger-on. Keep rigidly to your own business and do not speculate on the outside. Never depend upon influence, but rely upon yourself and your power of commanding recognition; the circumstances that can make or mar you are to a large extent within your own control. Remember that two words are absolutely debarred for the business vocabulary, namely, "forget" and "excuse." When asked to do a thing, remember that your superior or employer is the best judge of what the capabilities of a man in your position ought to be.

Finally, make a confidant of your employer; tell him your difficulties and aspirations. Ask his advice. If sick, tell him why; if going to get married, tell him when. He will esteem these confidences, and thus both will come to recognize that life is not all comprised between the hours the whistle blows or that the time register ticks off.

Learn to do well what you are told to do. The drawing of a dozen perfectly straight lines, or the adding correctly of a few columns of figures written out clearly and precisely, indicate a future successful bookkeeper or bank clerk. The dusting of the counter or the tying of a parcel point to a later good or bad salesman. The mechanic given a rough piece of wood or of steel to fashion to a given pattern shows his worth in the similitude of the finished product.

"What hast thou wrought is the world's demand,
What is thy product of brain or hand?
That produced, the wise world says,
"Take this place"—and the man obeys."

Again, the accurate delivery of a parcel or a letter, the use of the proper stamps, the putting back the ruler or the hammer into its place, the order carefully written out, the giving of a chair to a lady, the courteous reply, all small matters, you say, yet they indicate greater things for the future, and in the meantime show if you are slipshod, careless and indifferent. An invaluable aid in all this is the trade paper.

Let part of your first earnings be spent on a good trade paper or magazine; it will repay the investment a thousand-fold. They are the greatest educational factors in business life in this age and of invaluable assistance to any one desirous of bettering his position, be he mechanic, salesman, office or bank clerk. They show the latest improvements, models, fashions, inventions in every occupation, and will some day help to show your employer that you know as much as he does in some respects.

A few don'ts to those who do not wish to succeed:

Don't do more than you can help.

Don't take any interest in your work.

Don't look for anything to do when not busy.

Don't keep to your engagements, take the next best one that offers without consulting your employer.

Don't keep your mouth shut about your salary or your employer's business.

Don't try to improve your mind or exercise your body.

Don't save any of your salary.

All these will be found great helps to those to whom this article is not dedicated.

Don't come on time. Don't offer to assist.

Don't attend to your appearance.

Don't dust the show-case, it's the junior's job.

Don't mind the company you keep.

Don't read a trade paper.



Interior view of the Regina Plumbing & Heating Co.'s establishment.

Beautiful Interior View of Sanitary Engineer's Establishment

Showing What Can be Done by Way of Making the Establishment of a Sanitary and Heating Engineer Attractive.

IN these days of progress, one is apt to look around occasionally and sum up, as it were, the conditions as they were several years ago and as we find them now, and it cannot be denied that sanitary engineering has done wonders.

It does not seem long ago to the writer when he was lining tanks with lead for water supply system, which were first taken to the attic and then the house supply connected to the tank. In those days when a copper-lined bath was a luxury, and to have a w.c. installed in one's home was considered an excessively expensive matter, and when the plumber was looked upon as a first-rate tinker.

But what do we find to-day, and especially in Canada? Just look at the above interior view of the establishment of a sanitary engineer; everything up-

to-date, modern baths, w.c., bathroom cabinets, and various other fixtures, and none too expensive for the man of moderate means. Such progress has been made by the craft as a whole, and the various demands made upon sanitation.

Manufacturers have catered to the public in almost every way possible and millions of dollars are now invested in Canada alone, all because humanity as a whole are beginning to appreciate the value of comfort and convenience in the home.

Factories and offices are spending thousands of dollars on sanitary installation which, if recommended 20 years ago, would have thought such expenditure an absurdity. The interior we have

before us is that of the Regina Plumbing & Heating Co., Ltd., sanitary, heating and ventilating engineers of Regina. R. Harry Read is president and manager of the company. He is a Western Ontario man, and no doubt many of our readers will know him. We are told the business was established in 1907, and is all to the desired, Regina is a thriving city and from such an interior view one cannot help but form a very high opinion of the sanitary conditions of that fair city.

The business outlook from the standpoint of sanitary engineers is felt to be very good. This company are handling some of the nicest jobs in the city and are so proud of their accomplishments that they are getting out a book showing what they done in and around Regina.

The Sanitary Engineer

Plumber and Steamfitter of Canada

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TORONTO, APRIL 1, 1914

ANNUAL SPRING NUMBER.

THIS year we are placing in the hands of our readers the biggest and best issue of Sanitary Engineer ever published. Not very long ago it was decided to rename the paper and give it the title which was more applicable to the real work carried out by the craft. We have mentioned time and again the fact that plumbers and steamfitters were no more, and we felt we must live up to the new class of craftsmen who are making history every day. We have been plumbers too long, but are now being looked upon with greater respect. No doubt sanitary engineers have a responsibility to perform and to be able to cope with the duties which are so vital to humanity the craft must devote more time to study. They must read their trade paper, and we as publishers of the only Canadian trade paper which devotes all its pages to matters of sanitation, heating and ventilation, will do all in our power to give our readers the very best possible, both from a technical standpoint and as a guide to good buying. Those manufacturers who advertise in the pages of Sanitary Engineer, are of the highest reputation, their goods are the best value to be got on the market, therefore we would again point out to our readers the necessity for more study from every standpoint, so as to keep in line with the great strides which sanitary heating and ventilation has, and is making at the present day.

A RECORD YEAR'S WORK.

THE third annual convention of the Ontario Society of Domestic Sanitary and Heating Engineers is over, and to those who were in attendance it will be one never to be forgotten. The business which has been done by the directors and members alike was admitted to be of a very vital nature and splendid results are bound to be the outcome of such splendid work. Each and every report submitted by the various committees were well received and commented upon in a very commendable manner. No doubt the time is coming when such earnest

work as was done during the last year will be appreciated by the craft as a whole. While this society takes up such matters as will benefit their several interests to some extent, most of the subjects dealt with this last year were such as will in the end be of greater benefit to humanity at large, such as more progressive sanitary by-laws to safeguard the public, heating, ventilation, and various other laws. An apprentice code was discussed in a very able manner, all with a view of raising a higher standard of workmanship in the craft. A Provincial sanitary code of by-laws was discussed. It was also unanimously resolved to bring pressure to bear upon the various city councils to place a practical sanitary engineer upon each board of health.

HEATING AND VENTILATING.

IT IS very encouraging to note by reports from various daily newspapers that some attention is being given to matters of heating and ventilation. This is a matter of very vital importance, and as such, should receive some attention from our boards of health. Sanitary Engineer has advocated such a measure for some time and feels that it is just as important, if not more so, than our water supply. Therefore we are pleased to note that various municipalities are giving some thought along those lines, and in the near future we hope to see all heating and ventilating installations under some practical authority.

PROVINCIAL CODE.

ONE of the chief features of the recent convention was the report from the sanitary committee; the report showed the necessity of a strong Provincial plumbing by-law. This report showed the state which nearly all our small towns and villages were in from a sanitary engineering standpoint, and the data was not only interesting, but also of great value to the craft as a whole, in enabling them to present an efficient proposed plumbing code to the proper authorities.

The Business Outlook

THERE has been a big improvement in business with hardware jobbers during the past ten days. Since the first of the month when Spring shipping commenced, business has been picking up nicely.

In the metal markets, business is rather slow, and the number of orders is not large. Conditions appear sound and there is good reason to believe that before long there will be an improvement. Buyers are still cautious and are not buying heavily. Paint manufacturers are busy handling the Spring rush, and orders are plentiful, especially from the smaller towns and cities. With the opening of Spring there will be a resumption of building operations, in fact in many centres a large amount of building is now under way. Retail hardwaremen are looking forward to a large volume of Spring business, and although there has been much talk of hard times the Spring booking of the retail hardwaremen has been very heavy. Business in some lines is rather quiet at the present time, but there is every reason to believe that as far as the hardware trade is concerned there will be a big improvement during the next few weeks. The Financial Post commenting on the business outlook says in part:—

It is somewhat unfortunate that important questions left for Parliament to determine have been deferred to so late a date in the year. It would be much better for business generally if Parliament concluded its sittings by the end of February. Canada's commerce has assumed large, and will very soon attain still greater dimensions, out of which arises matters which have to be dealt with to a greater or less extent by Parliament. It would be much better, therefore, if all questions as to tariff and as to aiding work of development were settled early in the year, so that plans could be laid to commence work as soon as Spring opens up.

In the West shipments of grain are improving, and reports as to collections are not at all discouraging. Apparently all classes, not even excluding those engaged in rural pursuits, are still liquidating liability. This process cannot but have eventually very desirable results.

Some inquiries made amongst bankers elicited the information that loans were being applied for on an extensive scale to facilitate stock-raising and other forms of mixed farming. This policy in the course of a year or two will have good results.

In the face of steadily declining earnings of railways, contraction of bank clearings, Customs receipts and other indices of depression, it would be difficult for the average business men to view the future other than cautiously. Our factory plant as a whole is not working much more than 90 per cent. of capacity, and there was no immediate indications of demand requiring them to employ a larger proportion of their plant. This condition tends to money ease. Banks under prevailing conditions deem it better to pursue a very con-

servative policy. There will, however, be a tendency to be generous in so far as accommodation for the actual producer is concerned.

In London our loans are not being received as well as anticipated, and there are a good many, aggregating large figures, which are overhanging the market. This is no doubt due to several causes, the chief of which is the extent of our recent borrowings, and the next is the railway situation in Canada. So much has been said respecting waste of money on railway building as to give cause for the investor abroad to hesitate in making further advances. The attitude of our Government to railways and their construction will have to be defined by definite action before the clouds on the financial horizon of Canada will disperse.



EDITORIAL COMMENT.

The Ontario Convention of the Domestic Sanitary and Heating Engineers is over, and it was SOME CONVENTION SURE.

* * *

A never to be forgotten one.

* * *

No knockers were present.

* * *

All were earnest workers who came from far and near.

* * *

It sounded the note for good sanitation.

* * *

For technical education.

* * *

For a square deal all round.

* * *

Every member present was up and doing.

* * *

Each member realized the benefits to be derived from such meetings, and found out the weak spots of the craft.

* * *

A man should never be ashamed to own that he has been wrong; it is but saying in other words that he is wiser to-day than he was yesterday.—William Penn.

* * *

It is only those who do not know how to work that do not love it. To those who do, it is better than play—it is religion.—J. H. Patterson.



CANADIAN NIGHT.

THIS was an evening of enjoyment and was well earned by those who took part in the convention.

The Toronto branch of the society were the hosts and deserve great credit for the way the delegates were entertained. It was no half-and-half affair by any means. The guests sat down to as nice a repast as could be wished for, and a splendid programme of a high order followed.

Association Work Is Team Work— Then Associate

Some Information Concerning the Principles and Construction of Pump

Showing the Actual Practical Principles Which Are Embodied in All Pumps or the Construction of Two Styles Which Embody Those Principles.

By PROFESSOR ARTHUR BATEMAN, Director, Anglo-American Sanitary Correspondence College, Chicago.

A pump may be defined as a machine used for raising water or other liquid from a well or subterranean reservoir.

There are endless varieties of pumps on the market at the present time, but broadly speaking, those of interest to the sanitary engineer may be divided into three classes namely:—

The lift pump, the lift and force pump and the force pump. These are manufactured in endless variety, and of various materials. The material used in the early ages being wood fitted with iron handle, brackets and a spout. Cast lead was also much in evidence, and in numerous agricultural districts the above-mentioned are now to be found.

However, the casting of leading pump barrels, etc., in the dull season by plumbers is a thing of the past, with the exception of the smaller shops in the heart of the country.

Cast iron, brass, copper and gun-metal have now superseded the wood and lead pumps and can readily be obtained at a much lower cost than those formerly adopted.

The simplest form of pump, known as the lift pump, the jack pump or the suction pump, consists of a cylinder or barrel A, composed of any of the aforementioned materials, fitted with a piston and valve, known as the working box or pump bucket B, with a pipe called the tail or suction pipe D. The latter dips into the water in the well, and assuming the valves are efficient and the pump fixed in compliance with the laws of nature, water will be delivered through the pump head and nozzle just as soon as the handle is worked.

The construction of every type of pump is somewhat crude, necessitating periodical attention and many farmers learn by experience to re-leather the valves themselves, yet their knowledge on this subject is very limited and when unusual difficulties present themselves the sanitary engineer is called upon to rectify the existing defect.

Now to cope with this class of work in a masterful manner one must be thoroughly conversant with atmospheric pressure and the weight it exerts on all bodies under normal conditions. This is equivalent to 15 pounds on each square inch at sea level, and will sustain a

column of mercury 30 inches in height. Mercury is 13.6 times heavier than water so the same atmospheric pressure will sustain a column of water 34 feet high.

By making a partial vacuum at the upper end of any pipe or pump barrel whose lower end is immersed in water exposed to atmospheric pressure, we can cause the water to rise in the pipe in a similar manner to which we suck up liquids into our mouths through a straw. The filling of a syringe depends upon the same principle, as the piston is drawn up, the small quantity of air below it is expanded, and thus diminished

ceeding 34 feet. From this we learn that it is not practicable to fix the pump a greater vertical height than 34 feet above the surface of the water in the well, but in practice the maximum height should be taken at 25 feet, as much slip is lost in crudely-constructed valves, even when new.

There is no pump in existence driven mechanically or by any other means which will lift water above this height, yet a pump may be fixed either down the well or in close proximity to it, then after the atmospheric pressure has raised the water in the barrel it can be forced to any desired height, provided, of course, sufficient power is exerted on the piston rod.

It is not absolutely necessary to fix the tail pipe perfectly straight or vertical. In fact, it can be run horizontally for some distance, care being taken to give the pipe a pitch its entire length from the pump to the well, and thus avoid all air pockets. If this detail is not carried out it will be extremely difficult to draw off the air.

In the lift pump, Fig. 1, the mode of action is as follows:—Suppose the piston at first to be at O and the tail pipe filled with air at the atmospheric pressure. If the piston be raised, the air in the tail pipe will expand; open the valve C and follow the piston. At the same time, since the pressure on the surface of the water within the tail pipe is diminished owing to the expansion of the contained air, the external pressure at X will cause the water to rise in the barrel to such a height that the elasticity of the air below H. G. together with the weight of the column of water above X in the tail pipe, equals the atmospheric pressure without.

As the piston descends the air below it is compressed, and escapes after a time through the valve B, the valve C being closed by the increased pressure of the air above it. Thus the water remains at the same level in the tail pipe whilst the piston is descending. When the piston is again raised the pressure is removed from above O, and the air underneath it at once opens the valve and occupies the space beneath H. G., the water rising in the suction tube as before. This action continues till the

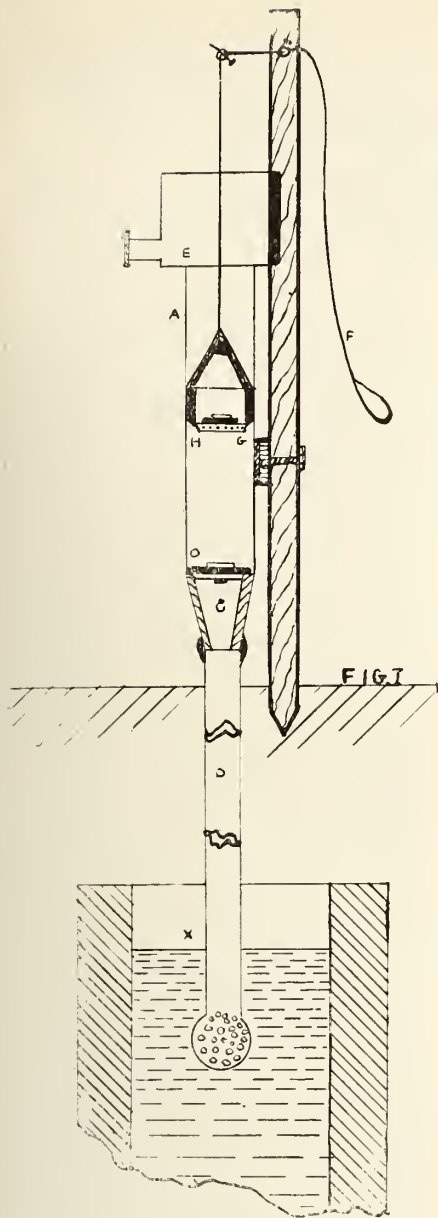


Professor Arthur Bateman.

in pressure, so that the liquid in which the lower end is immersed is forced in by the greater atmospheric pressure without.

However, if the space below the pipe is originally full of water instead of air, the action will be still more prompt, for water does not expand to the same extent as air, and if the lower end were closed, the smallest movement of the piston would suffice to produce an almost perfect vacuum.

Assuming the lower end to be open and inserted in water, the latter will follow the piston to any height not ex-



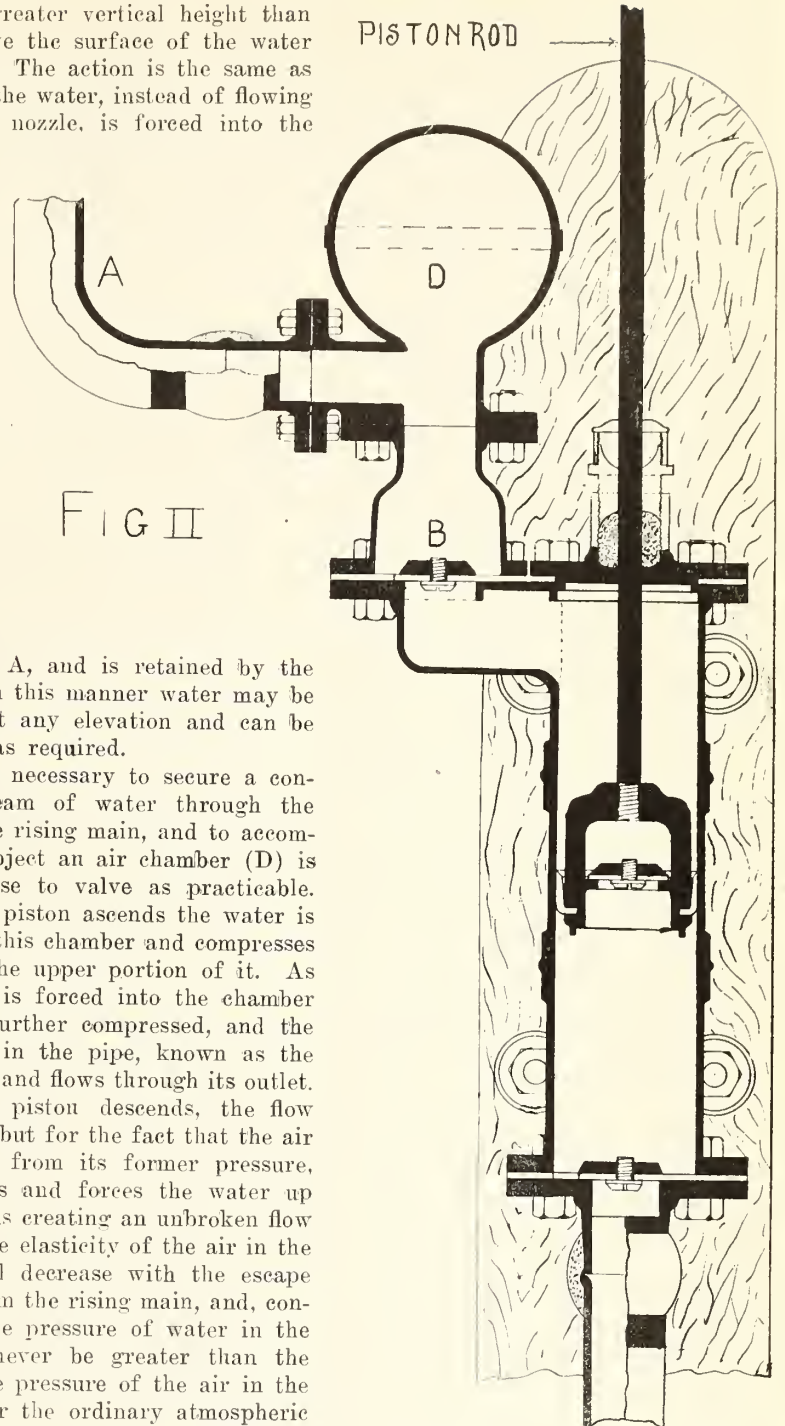
water has risen to O, when the raising of the piston causes the water to enter the barrel.

As the piston continues to rise the water will follow it so long as the height of the piston above the level of the water outside is less than that above B. As the piston descends, the pressure of water beneath it opens the valve B, and the piston passes through the water. When the piston again ascends the water is discharged at the nozzle, and the barrel is refilled through the tail pipe. The water having once entered the barrel, the contents are discharged at each upward stroke of the piston.

In numerous instances it is imperative to raise water from a well to a storage tank fixed in an elevated position above all the fixtures in the building. Assuming such to be the case, a pump known as the lift and force pump, as shown in Fig. 2, is adopted.

This pump, which is really a modification of the common lift pump, must not

be fixed a greater vertical height than 25 feet above the surface of the water in the well. The action is the same as before, but the water, instead of flowing through the nozzle, is forced into the



rising main A, and is retained by the valve B. In this manner water may be stored up at any elevation and can be discharged as required.

It is very necessary to secure a continuous stream of water through the outlet of the rising main, and to accomplish this object an air chamber (D) is fixed as close to valve as practicable. Now as the piston ascends the water is forced into this chamber and compresses the air in the upper portion of it. As more water is forced into the chamber the air is further compressed, and the water rises in the pipe, known as the rising main, and flows through its outlet.

When the piston descends, the flow would cease but for the fact that the air in D, freed from its former pressure, now expands and forces the water up the tube, thus creating an unbroken flow from A. The elasticity of the air in the chamber will decrease with the escape of water from the rising main, and, consequently, the pressure of water in the pipe must never be greater than the excess of the pressure of the air in the chamber over the ordinary atmospheric pressure.

It must not be supposed that the employment of atmospheric pressure for the raising of water in pumps dispenses with the necessity for expending work in driving the pump. The work so expended can never be less, and practically always more than the work represented by the weight of water raised. Suppose we have a column of water 40 feet high and 2 square feet in section sustained by atmospheric pressure and in contact, at its upper end, with a piston which separates it from the outer air, this piston will be pressed down on its upper side by atmospheric pressure acting on 2 square feet of surface—that is, by a force equal to the weight of about 64 cubic feet of water, while the

force pressing it up from below will be equal to the weight of only 68-40, that is 28 cubic feet of water. Hence, neglecting friction, etc., a force equal to the weight of 40 cubic feet of water will be required to sustain it, and obviously mechanical means must be adopted to work the piston.

The "force pump" is often employed by sanitary engineers to remove stoppages in waste pipes. Practically speaking, water is incompressible. A pressure of 15 pounds per square inch will compress it to .0000503 of its bulk. From this it will be readily understood that all stoppages can be removed, if we can apply sufficient force on the piston of the pump.

Sanitation, and the Necessity of Universal Laws to Govern Sanitary Engineering*

Showing in a Practical Way the Conditions Found Throughout the Dominion of Canada and How Such Conditions Could be Remedied.

By JOHN W. BRUCE

I appreciate the opportunity of appearing before this commission for the purpose of presenting for your consideration a subject matter of great importance to the welfare of the nation.

One of the essential features to the general health of the community in the application of sanitation is efficient methods of sanitary plumbing, heating and ventilation. And in aiming to protect and prolong the life of the people, efforts should be such that this important problem should be legislated for in the interests of the nation.

Sanitation and ventilation has gained world-wide prominence by the efforts of the medical profession, scientists, sanitary engineers, and public bodies endeavoring for a number of years to introduce measures that could be accepted as standards of efficiency, and by the earnestness of such men there has evolved a sanitary system based on fundamental scientific principles that can practically be adopted in any portion of the world, giving the highest degree of efficiency so necessarily due such an important problem, and which for the absolute protection of public health must be legislated for. Like all legislation of a restrictive nature we find a good deal of opposition from those who are ignorant of the real value of such legislation; but with a process of education in the adoption and enforcement of restrictive law, the future life of the nation is protected and benefited, and it is then readily welcomed as being essential to the national welfare. And it is with this view that I introduce the subject for the consideration of this commission.

General Conditions in Canada.

In the Dominion of Canada we have no recognized universal standards regarding sanitary plumbing and ventilation but are governed by a multiplicity of laws and by-laws, adopted, regulated and controlled by the governing bodies of our cities and towns and operated according to their own interpretation. In the year 1887, Toronto adopted the first plumbing ordinance in Canada, which was followed by many others until today the majority of our cities and towns have some form of ordinance. In some we find splendid principles making for

effectiveness but rendered void because of non-enforcement—and in many no recognition whatever that any law exists—with the result that the sanitary plumbing is installed in such a way that it becomes a menace to the public health.

New Brunswick, and Saskatchewan are the only provinces which have faced this problem seriously and have been progressive enough to adopt a general law, but which is suffering to-day for lack of enforcement. But I believe that with some effort in the future the value of these laws will be more fully recognized.

In the majority of our larger cities, there is a desire to study and meet the demands; so much so that we continually see them amend their laws to meet changed conditions in which they find the industry. Many have adopted the plan of examining and licensing the men engaged in this industry with such beneficial results that many others contemplate following the same procedure—which is claimed as an essential point in placing sanitary plumbing on a proper recognized basis in its relation to health. From the Atlantic to the Pacific we have many varieties of sanitary plumbing, some a distinct credit to the forethought of our boards of health and municipal councils, and others an absolute disgrace to the name of sanitation. Some of the abuses call for serious consideration. Not long ago in a public school building, I saw sanitary drinking fountains connected directly without traps to a 2-in. soil waste. Many kitchens are contiguous to sanitary conveniences. Toilet accommodation often placed in unvented rooms contiguous to bedrooms, these being of such a serious nature that they alone should demand attention.

In the city of Montreal, the first city of the Dominion, with a population estimated at 500,000, the general conditions of sanitary plumbing are a disgrace to civilization. While some of the better type of building conform to higher standards, it is due more to the demands of architects than the requirements of the law. One can readily understand their high mortality of 20 per thousand, when we see their supposed system of sanitation. We see the ridi-

culous situation here of examining men who are to engage in the industry, and then allow them practical freedom in the installation of work, and many are installing work who have not even conformed to this law. There is a measure of inspection, but without any test as to its fitness for the demands on it, by men some of whom are not practical, and have not the necessary knowledge to qualify them for such positions of trust. Then we have the city of Toronto with estimated population of 400,000, which has a death rate of 12.8 per 1,000. There we have a rigid by-law embracing the highest principles of sanitation, but recognizing some very low standards of materials that have been rendered obsolete for years—a complete system of inspection, aiming to fulfill the requirements of the law, so that the general health of the community is protected. And so on, Winnipeg, Calgary, Edmonton, Vancouver, Victoria and Halifax, each have their own ordinances recognizing principles, but with particular ideas and fads of individuals for the time being have had same adopted in their by-laws in defiance of recognized sanitary principles. In this particular regard it is easy for the time being to overcome some point of scientific attainment by the faddist, but the natural law as outlined and recognized by modern science in the forms of sanitary plumbing based on the theories and practices of nature as against the mechanical devices to usefulness is overwhelmingly in favor of the former. But the poor conditions prevailing in some of our large industrial centres is a very serious matter. The city of Hamilton, with a population of over 80,000 people, without any recognized system, and towns like London, Guelph, Kingston, Galt and Windsor, in a similar position in Ontario. Quebec and Three Rivers in Quebec, Brandon and Portage La Prairie in Manitoba, Fernie and Kamloops in B. C., Amherst and Truro in Nova Scotia. The poor standards of work recognized with practically no ordinances governing the work all tends to lower the standards of efficiency in relation to sanitation, and as these large centres embrace a large working class population they, therefore, become the greatest

*NOTE—This article was read in Ottawa before the Dominion Conservation Commission and was well commented upon.

sufferers. These cities and towns in the future will probably be some of the large centres of population and means to improve sanitary conditions by a universal standard should be the aim of all. Even now with the advance of sanitary education, we see plenty of our cities working on amendments to their laws and while not recognizing any set principles are merely governed by what has been satisfactory in some other city practically from their lack of knowledge of the science of sanitation, whereas if by some action of a Federal body or central authority a set standard was established it would prevent the useless experimenting and continual alteration of laws and would serve the real purpose for which such laws are intended. There can be no serious objection to legislation along these lines, as already all the important cities and towns with few exceptions have some form of local legislation and any attempt at unification should receive support. In Western Canada an organization of plumbing inspectors, master plumbers, and journeymen plumbers was formed last year whose object was the establishing of a uniform system if possible in Western Canada by mutual consent to overcome the present chaos owing to such a multiplicity of laws in the various cities and towns, and place the industry in a more satisfactory position than it is at present. Sanitary plumbing has made greater headway in Western Canada than the East, realizing their own importance they are trying to meet the demands of the future by a universal system of installation, inspection, examining and licensing of those engaged in the industry, and it cannot be denied that at the present time that in those towns who have these standards they are receiving the reward of their efforts by having as high a degree of efficiency both scientifically and mechanically, as anywhere in the world.

Needs of Unification.

The utility of changing the present methods was never greater than at present. With the evolution taking place in the plumbing, heating and ventilating industry and the advanced forms of scientific system and ventilating equipment it almost becomes necessary to form universal codes. While there may be some impediment in the way by various legislative enactments, still with co-operation these may be overcome.

Such States as Illinois, Ohio, Wisconsin and Massachusetts, along with other states, adopted very successful state laws, with enlarged powers granted to the boards of health and the setting standards that have been found to operate successfully all over their respective states, with a state inspector of plumbing, with the examining and licensing

of the men who work in the industry—and knowing the many constitutional difficulties that beset them, it should encourage a feeling to surpass them in our efforts to protect the lives of our people. Under our present system, with our multiplicity of laws and elasticity of many of them, the defects are manifold, and it is surprising the many interpretations put on same, due to no very rigid forms of administration, and this in a large measure accounts for our non-success. In many towns we find the administration left in the hands of an unsympathetic department, or men being employed as inspectors who have no knowledge of the industry, and have been selected purely on account of personal or political reasons; therefore, we find low standards of workmanship very common and a menace to public health.

To realize what this means we have to look at the records of disease and death and compare the statistics of those highly protected towns with those whose administration is lax. Most forms of diseases are highly susceptible to hygienic means, and thereby controllable under a properly restricted system of sanitation. Dust, filth, foul air, lack of light and ventilation, are very important factors in causes of tuberculosis, infant mortality, and acute contagious diseases. In taking five cities under similar conditions we find the following results in 1913:

Per	Tuber-	Inf.	
100,000	culosis	Mort.	Typhoid
Toronto	95.7	No Satis-	10.4-5.3
Milwaukee . .	101.01	factory	11.5
Cleveland . .	128.0	Records.	14.1
Buffalo	149.9		9.2-5.59
Montreal . . .	215.9		19.4

The figures show a great difference between the highest and lowest city and they can be practically compared in the same order of their administrations and effectiveness of sanitary legislation.

These convincing figures and facts prompts the efforts of medical men and sanitary engineers and those engaged in the industry to seek rigid laws governing the installation of such work.

At the present time Halifax, Montreal, Port Arthur, Moose Jaw, Saskatoon, Edmonton, and Calgary examine the men engaged in the industry, and with no two cities or towns in the Dominion having similar laws. The mechanic who for economic or other reasons travels in search of employment has to undergo the ordeal of qualifying in each of those towns on a different basis. Whereas by the adoption of a universal plan the mechanics engaged in the plumbing industry once qualifying would be fitted to meet the conditions in all parts of the Dominion.

The industry should be governed by stringent regulations irrespective of old-

time superstitions and sentiments that are proved to-day to be absolute fallacies as the work accomplished by those engaged in this industry will compare more than favorably with any other form of industry both for usefulness, quantity and quality and demanding a higher degree of intelligence and ability than any other trade in the building industry.

Necessity of Federal Law.

With the present unsatisfactory system provided by this multiplicity of laws and its attendant dangerous conditions, it compels us to realize the necessity of Federal laws for the control of sanitation and ventilation. Realizing that the cities and towns of the Dominion recognize the value and necessity of such laws and are making an endeavor to fulfil in some measure the demands of humanity now by efforts at local government, then in a greater ratio should be the necessity for Federal control by adopting laws that will serve as minimum standards without preventing the addition of such local laws that may be necessary by reason of climatic conditions.

The nature of the legislation will be classed as restrictive, but it is in the interests of public health that it should be so. And the duty rests with governing bodies to see to its effectiveness. It should embrace the modern sanitary standards of installation and materials with a thorough system of inspection and testing to see that it fulfils the requirements of the law, with laws governing the installation by practical mechanics who have undergone an examination and shown their qualifications to work in the industry. Some may claim that this would work a hardship on the industry and those engaged in it. But if the national health is to be conserved by legislation then it logically commends itself that those engaged in such work should understand the underlying principles and practices of that industry.

Accommodation in Hotel and Buildings.

One serious phase of sanitary law at present is the neglect of administrators to fix standard of requirements for the necessary accommodation to meet the demands in the various buildings within their jurisdiction. In many of our cities the conditions of our hotels are deplorable. The sanitary conveniences having to serve as public utilities with a certain amount of overtaxing, rendering them unfit for use and in many a lack of effort at cleanness is apparent, with the consequent repulsive feeling when forced to use them. And with the abuses in these conveniences comes the consequent dangers of carrying disease away from them. Many of our hotels at the present time lack the requisite number of con-

conveniences allowed by competent authorities on their public floors, and it's a common thing to find many of them without conveniences or with disgraceful makeshifts on some of their residential floors, making it necessary at times for guests to use the public conveniences and run the risk of attendant dangers from communicable diseases due to uncleanliness. It should be the aim of governing bodies to so legislate that there should be a maximum amount of necessary sanitary conveniences based on the average occupation of the residential accommodation of such place, and the proper attention to the requirements of the portion serving the purposes of public conveniences and due regard to their construction so as to serve the best interest of public health. The conditions in apartment and rooming houses are exceedingly unsatisfactory, the efforts to conserve and minimize in space has not only developed in the living rooms but has extended to the bathrooms. In many apartment houses fixtures are crowded into rooms whose usefulness is impaired and the cubical area from a sanitary standpoint a disgrace to the name of a bathroom so that legislation should be enacted governing bathrooms the same as living rooms. But in rooming houses particularly there is a lack of knowledge of the requirements of those who have to live under those conditions and particularly in some cases where office buildings have been turned into rooming houses. It is not an uncommon thing to find one w.c. without bath or lavatory accommodation serving the needs of the occupants of the whole flats. Then again we have to meet the attendant evils due to economic circumstances of those who use their rooms not only as sleeping but living rooms, in which they cook their meals, making it necessary for them to use the w.c. and lavatory basin as slop receptacles. And it should be a firmly established law that no houses of this kind should be erected without all the necessary sanitary conveniences for health being installed on a basis of a minimum amount to cover the number of persons allowed for in the accommodation. Many of our large public and office buildings including departmental stores, at the present time are lacking so much in sanitary conveniences that they become a nuisance. You can enter many of them and find them taxed beyond their usefulness by large numbers who use these places as public comfort stations to the detriment of those employed in same and efforts should be made to conserve space for those who by their duties are compelled to remain within the buildings.

But our factories produce the worst forms of abuses and the word sanitary is a misnomer. Some of these so-called

sanitary conveniences become so repulsive through lack of attention to requirements and cleanliness that they become a menace to public health. It is a standing disgrace in some industries to see sanitary equipment doing service for both sexes, and again the toilets being used as urinals which means so much filthiness—and by such use they become a menace instead of a benefit. In all places where men are employed in number, urinals should be compulsory both from the standpoint of health and the conservation of water due to less requirements in the amount of water for flushing purposes, and due regard should be paid to light and ventilation.

With the present overcrowding of many of our private houses, we face serious conditions by the overtaxing and misuse of sanitary conveniences. Dr. Hastings reported lately that in Toronto alone there were 3,000 houses originally intended for one family that at present were harboring from two to five families.

We find large houses with all the luxury that wealth can command fitted out with the finest equipment and installed under the best conditions regarding workmanship possible and we recognize that this gives them the measures of health protection they are seeking. Architects and owners demanding plenty of light and space for their bathrooms and toilet accommodations then compare this with the crowded ill-lighted, unventilated conveniences of the private houses and tenement flats with 2 and 5 families living under one roof and realize that if it gives the protection desired in one the more greater reasons it should be legislated for in the other to protect the great mass of struggling humanity.

With the advent of advanced methods of sanitation it has opened up an avenue whereby the farmers and those living in rural districts can have all the modern sanitary comforts, but the only measure of protection that can be afforded him is the guarantee of the recognition of standard that he will be open to exploitation with being outside a city's influence in relation to sanitary laws. Universal laws would protect him to the fullest extent as the recognized law and make it necessary that any work being done would conform to the same standards as demanded in a city and subject to the same measures of inspection.

Public Comfort Stations.

The great and growing need at the present time is the recognition by governing bodies of the necessity of public comfort stations. But it is a disgrace to have to admit that in the Dominion of Canada they are conspicuous by their absence. While some of our larger cities have met public demand by the build-

ing of some in the public parks and popular resorts, still there is a decided absence of them where they are most needed, that is, in the busy section of our cities and that is why the demand is so great on the conveniences in our public buildings and hotels. The cities are practically making some of its property holders assume the burdens they themselves should incur. This is an important problem and one that deserves more attention than ever it has in the past and legislation should be enacted compelling the establishing of these stations in the busy centres and a long-felt want will have been fulfilled which will show a marked effect on the people in a greater proportion than some would seem to imagine.

Speculative Building.

One of the most disturbing factors to be faced is the speculative builder whose whole aim is the amount of profit and not the degree of efficiency or recognition of any sanitary laws, because he is not building for his own personal occupation but for sale and with the competitive system prevailing everything is kept down to such a minimum of cost that all standards are abused and supposed attractive outside architecture is considered superior to the consideration of health laws. Inside the living rooms are reduced the minimum bathrooms, too small to be useful with the poorest classes of equipment that call for continual repair and a menace to public health. Even in those cities that have effective sanitary legislation they find at all times a desire on the part of the speculative builder to encroach upon the law and in many ways they are successful. When they can't best the law by uses of materials they will generally hire incompetent mechanics and sublet work at prices that those engaged in the industry know, that some means are being taken to avoid the laws. So that if legislation was ever necessary its time would not be more opportune than now when thousands of homes are being built annually. the permanent residences of the future citizens coming to this country with the same health desire as our own people to have brighter and healthier homes by the uses of all the best devices for the safeguarding of health and the recognition of proper sanitary standards, and they should be aided in that desire by such legislation that will guarantee them protection from the unjust exploitation being carried on in speculative building.

General Health Review.

The importance of the protection of human life should be the first consideration of any nation and any measure aiming to that end should receive serious and earnest consideration. Every coun-

try to-day has to meet this new demand made by the advancement of science. We in the Dominion of Canada have advanced a stage beyond most others and efforts to prove the usefulness of such a course should be our first aim. It is to be regretted that in some of our cities we have such a high mortality rate and this is due in a great measure to the lack of recognition of sanitary law. The death rate for the five cities per 1,000 in 1913 of about same proportions are as follows: Toronto 12.8, Milwaukee 13.2, Cleveland 14.1, Buffalo 15.8, Montreal 20.00.

Therefore it is no use denying the fact that recognition of advanced sanitary standard benefits the health of the community.

The old truth that mankind responds to its environments is true in sanitation and our aim should be to have the most efficient form of service that can be obtained.

Due regard should be shown to cleanliness by the power of law with rigid forms of inspections periodically by competent inspectors and we cannot suffer thereby as sanitary plumbing goes into a home once and in one of the smallest demands for its usefulness in the cost of construction. Cost should be as nothing as compared to the protection received through its efficiency and aid to the general health of the community. Lack of attention to ventilation has been a great source of trouble and minimum space should be allowed and due regard paid to the needs of pure air, in all buildings, and some stringent regulations should be drawn governing the many mechanical appliances used for ventilation in operation at present.

Sanitary Drinking Fountains.

The great necessity of sanitary drinking fountains urged by the medical profession as a preventative of disease is another means, whereby the health of the nation can be conserved. While there has been a great deal of progress, still due regard has not been shown in the erection and installation of these necessities. Many times they are erected in inaccessible places and allowed to get into such filthy conditions that they become repugnant. They should be erected in the most accessible places with plenty of light and air so as to keep them free from contamination and so regulated that they do not become part of the ordinary sanitary system of any building without direct interception from the main drains.

Conclusion.

Every country in the world at present has had to face these problems in one form or another and the statutes of every state and nation are replete with the laws concerning the public health.

Forty years ago plumbing was considered a luxury, but at the present time sanitary plumbing is a necessity and within the reach of everybody even the farmer and rural citizens and is now recognized as essential to public health.

The protection afforded by legislation has been the results of evolution and some conditions once tolerated are now known as dangerous to life and are therefore controlled, but the matter has too long been left to the will of the individual cities and towns that any attempt to over-ride these privileges has been resented, but now with the advance of science and a broader spirit recognizing the demands for a greater measure of protection of human life, some countries are now facing these problems by the introduction of state laws.

But at the present time with the powers reposed in this conservation commission of initiating legislation for the advancement of the interest of the people of this Dominion, we are in a position to make some of the most advanced sanitary moves known to the world showing that the conservation of human life in this Dominion by the recommending and adoption of progressive laws governing sanitation is of supreme importance and the powers of government being used in the interest of the national welfare aiming for a healthy, happy race of people.



COUNCIL APPOINTS A BOARD OF HEALTH.

In accordance with the requirements of the new Towns Act, it has become necessary for Camrose to have a board of health. The council made the appointments as follows: — J. Watson Younge (three-year term), J. K. Burgess (two-year term), and F. L. Farley (one-year term). This arrangement will make it necessary for the council to appoint a new member to the board of health each year. The mayor and town engineer are ex-officio members of the board. It will be the duty of the board of health to make monthly reports to the Provincial Health Department at Edmonton, and to act in the best interests of the community in all matters pertaining to public health.

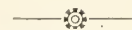
Mr. Appleton was empowered to act as building inspector, inspector of plumbing installation and inspector of all electrical installations.

New Electric Light Rate.

The council officially sanctioned the reduction in the electric light rate from 18c. to 15c., and from 15c. to 12c. per k.w. hour, with a discount of 5 per cent. in place of 10 per cent. as hitherto.

Commissioner Appleton was authorized to purchase a standard water meter

for the purpose of testing the service meters.



A SPLENDID MOVE IN NEW BRUNSWICK.

St. John, N.B., March 28, 1914.

Editor, Sanitary Engineer.

Much interest is evinced by members of the plumbing fraternity in St. John and through the province generally with regard to a bill now before the Local Legislature at Fredericton concerning improvements and progress in the trade. It is strongly supported by the boards of health and also by the majority of the master and journeyman plumbers, hardly any opposition being heard from these quarters, but there has been a movement against it on political grounds, an endeavor being made to try to show that the bill will create a "trust," favoring the larger merchants from whom the trade must buy stock and crowding out the others.

Several local plumbers, both masters and journeymen, when asked concerning the matter, were most emphatic in declaring that the bill before the Legislature did not emanate from the Plumbers' Association, but was a health measure fathered by the medical health officer and the board of health. The bill, they pointed out, has no bearing upon the matter of purchasing supplies, nor could it in any way create a monopoly as intimated. It deals only with a licensing system similar to that in vogue elsewhere in Canada and through the United States.

The bill provides that no plumber can engage in work in the city or county of St. John without direct and immediate supervision unless he has a license or is possessed of three years' experience. Licenses are to be issued without examination or payment of a \$5 fee after the passing of the bill to those who have been engaged in plumbing for at least five years. Those who have worked for five years under supervision or direction will be required to pay the fee, but not to take examination.

The commotion caused by the introduction of the bill into the Legislature was such that at the request of some of the master plumbers a meeting of the board of health was called for the express purpose of explaining that the bill was a move on the part of the board regarding plumbing inspection, and not an endeavor on the plumbers' part to create a "trust." The aim is to secure better service, and more generally satisfactory work. Whether or not the bill will be put through this session cannot be said, as it has not progressed far enough in discussion to note what the views of the members are towards it.

D., St. John, N.B.



Some of the members of the Ontario Domestic Sanitary and Heating Engineers who attended the Third Annual Convention held March 19, 20 and 21 in Canadian Foresters Hall, Toronto.

Ontario Society of Domestic, Sanitary and Heating Engineers

Third Annual Convention of the Above Society Took Place on March 19, 20 and 21 in the Canadian Foresters' Hall, 22 College St., Toronto, a Large Number of Delegates Were Present From All Parts of Ontario.

This convention was by far the most successful of any previously held. The amount of business taken up and discussed was remarkable, and of a high class. The various committees had very interesting reports to submit, which showed they had been working hard during the year 1913-14. Every phase of the sanitary and heating business received much attention. It was very encouraging to note the amount of good work accomplished all along the line, and judging from the amount of work allotted to the various committees, the coming year will be one of hard work for all. The most encouraging features of the whole convention were, the statement that different municipal Boards of Health were being reorganized and that a member of the craft was being placed on each; and the fact that practical technical education was to be established for sanitary engineers at the new Toronto technical schools.

A MEETING of the executive committee was held in the office of the Toronto Committee of Domestic, Sanitary and Heating Engineers, room 507, Canadian Foresters building, on Thursday morning. Directors Maxwell, Hicks, LeGrow, Mansell, Corr. Seely, Frankland and Chairmen Brittain and Sturgeon were present.

President Maxwell called the meeting

to order and the secretary read the following reports.

- (1) The directors' report including:
 - (A) Answers as received from the solicitor regarding selling and purchasing of goods, by and from the manufacturers or wholesalers.
 - (B) An essay by Lewis LeGrow on the value of technical training in its relationship to plumbing construction.
 - (C) Report of delegation that visited

New York, in regard to technical training.

- (D) Specification of hot water heating system.
- (E) Apprentice indenture form.
- (F) Statement of finances 1913.
- (2) Report of chairman of sanitary committee, R. G. Sturgeon.
- (3) Report of chairman of arbitration committee, J. A. Caslake.

(4) Report of chairman of apprenticeship committee, W. C. Brittain.

(5) Report from manufacturers' committee, E. H. Russell.

No reports had been received from chairmen of heating, legislation, educational, and examination committees.

On motion of W. Brittain, seconded by L. LeGrow it was resolved that the reports as read be accepted and that they be brought before the members at the annual meeting.

The minutes of the directors' meetings for 1913 were taken as read, excepting the minutes of the last directors' meeting held March 14, 1913, which upon motion of R. G. Sturgeon seconded by W. Mansell was accepted and forwarded on to the annual meeting for action.

The application of G. W. Millward of Port Hope, was received and upon motion of R. G. Sturgeon, seconded by L. LeGrow was received pending the report of the examination committee.

No other business coming up, the executive committee adjourned for lunch at 12.30.

Proceedings Open.

The first general session of the convention opened Thursday afternoon at 2.15.

President Maxwell took the chair, and upon calling the members to order, introduced Controller McCarthy, Vice-Chairman of the Board of Control, who took the place of Mayor Hoeken in giving the opening address as stated on the program.

Controller McCarthy welcomed the delegates to Toronto with great pleasure. He gave figures to show the number of houses where sanitary appliances had been installed at the order of the Medical Health Board in Toronto in the last two years. He also mentioned the benefits to be derived by the citizens from the work done by our craft. He compared the modern city with its sanitary systems of to-day, to the older cities of Europe with their ancient methods, and remarked about the vast improvement that had taken place in these lines in comparatively few years.

Ald. Ryding also extended a very pressing welcome to all the delegates. He would go farther than Controller McCarthy, and would hand over the keys of the City Hall to the members; and tell them if there was anything they wanted, to go and take it. Because he knew that his trust was well placed, and while he was responsible for them, he had no fear of the consequences as he knew they were all honorable men. He trusted that at an early date we should have inspection of heating installations, as well as of plumbing work, as at present.

President Maxwell thanked the controller and alderman, and trusted that

they would in the future endeavor to have a sanitary engineer on the local board of health.

Controller McCarthy in reply expressed his willingness to assist the members to secure a representative on the local board of health as there were many questions that needed the knowledge and experience of the craft.

The Members Present.

The roll call of members showed the following to be present:

R. G. Sturgeon, Peterboro; W. C. Brittain, Hamilton; G. W. Millward, Port Hope; F. Rudow, Elmira; Louis Gies, Dundas; R. A. Schl, Waterloo; W. A. Spalding, of Preston; Geo. E. B. Grinyer and Harry Mahoney, of Guelph; A. J. Hemphill, G. H. Hoople, H. A. Bald, Andw. T. Riddell, H. J. Conn. of St. Catharines; C. F. Needham, E. H. Russell, Edw. Holland, A. E. Gibbons, Wm. Skelly, John Eggett, Ben Noble, Thos. Rich, and James R. Haslett, of London; J. D. Anguish, W. Albert Tipper, and T. A. Cowan, of Brantford; J. Hainsworth, Wm. Knell, Hy. Wolfhard, of Berlin; E. H. Barnes, of Soo; Frederick Sainsbury of Weston; H. S. Brown, of Brockville; H. J. Peter, A. E. Sylvester, Dan. MacDermid, Thomas E. Henry, C. Myers, and F. J. Sylvester, of Stratford; F. R. Maxwell, Harry Hicks, E. Lewis LeGrow, G. F. Frankland, H. G. Waterman, Wm. Mansell, F. H. Gentle, Thos. W. Ferguson, John Wright, J. R. Seager, D. Glynn, T. Maxwell, A. F. Passmore, Geo. Kirtley, U. Sauston, W. E. Ramsey, J. T. Agget, A. H. Read, T. B. Smyth, Geo. Cooper, T. H. Hutcheson, Ed. Max, W. R. H. Daniels, E. Hillier, T. W. Price, J. H. Warwick, J. E. Fullerton, A. C. Schultz, T. F. Kelly, Robert Shannon, G. Clapperton, Archie Melhuish, W. J. Cracknell, and H. W. Farthing, of Toronto.

President Maxwell then selected the following committees:

Credential committee: Messrs. Passmore, Hillier, and Hemphill.

Select committee: H. A. Bald, John Wright.

Resolutions committee: H. Mahoney, E. H. Russell, J. D. Anguish, F. Rudow, and Wm. Mansell.

H. Mahoney, of Guelph, requested the chair to relieve him of acting on the resolutions committee, but upon the secretary drawing the attention of the president, to Mr. Mahoney's usual tactics on occasions of this kind his request was not granted.

President Maxwell asked for suggestions from the chairmen of committees, also for any resolutions the members wished to bring forward.

Those chairmen present claimed they had no suggestions to offer other than those appearing in their annual report, and the members not having any reso-

lutions to bring before the meeting, it was decided to have the directors' and chairmen of committees' reports read.

Directors' Report.

No. 1.

The secretary then read the directors' report.

Gentlemen,—It was with a great sense of responsibility that we accepted the office of directors for the past year, and we are thankful to report that we are more than pleased with the success of this the third year of our society. As you are all aware, it has been a trying year, not the same amount of business, and the money market was very close, which made it harder to do business; and when these two go together it means a great deal of hustling to get business and prices get closer than ever, if this is possible. But with it all, we have to report that not one member went under the hammer, which speaks well for the class of men that we have in our society.

We would advise that when you are asked to recommend anyone for membership, you size him up very carefully to see if he is a proper person to become a member, as by doing this you will assist your directors in keeping our society for the best men in the sanitary and heating profession, which is becoming more important every day.

No. 2.

Nearly every college is going to or has put on a course in our line. All the technical schools throughout the provinces are going into our lines extensively. So you see that we are about to take our proper place in society, and it behoves everyone to help and assist each other to keep pace with the onward movement. As you know, Ontario is no small place, and I think that we can say with every assurance of not being contradicted that it is a prosperous province, and every town, village and city are awakening to the fact that they must protect themselves by having good sanitary arrangements, and with this end in view the provincial officer of health has appointed different officers throughout Ontario to assist him in trying to procure information in reference to same.

Your directors during the past year have also been working along these lines, as you will have seen by the letter in which you were asked several questions, that at first sight might not appear of any importance. I can assure you, however, that they are very important to your directors, as we intend to submit them to the provincial officer of health to show him the great need of universal sanitary laws. We are satisfied that if there is anything necessary to make our people happy and prosperous it is to have good health, and the



DELEGATES TO THE RECENT CONVENTION.

No. 1, F. Rudow, Elmira; 2, G. F. Frankland, the newly appointed Permanent Secretary; No. 3, R. S. Haslett, Instructor of Sanitary Engineering at the London Technical School.

only way to get same is by having all our appliances in reference to sewers, etc., laid out and installed in the most modern and sanitary manner; and the only way to do this will be to have a provincial sanitary by-law for Ontario.

We sent out 200 letters with the following questions to be answered. We received eighty replies, which your directors think is a fair average, and we are still hoping to receive more:—

1. Have you a sewage system in your town?

2. Where does it discharge?
(Please name lake, river or disposal plant.)

3. Have you a waterworks system?

4. If so, where is its source of supply?
(Name lake, river, wells or springs.)

5. Are you working under a plumbing by-law or any regulations regarding the installing of plumbing or drainage systems?

(If so, please send copy of local by-law.)

6. Have you a system of plumbing inspection?

Note.—Please sign your name in full, and give name of town, as we need these for reference.

No. 3.

The past year we have increased our membership by the addition of some of the brightest men of our profession, and if it is not what we expected in numbers, quality made up the difference. We wish to ask every member of our society: "What are you doing to increase our membership?" Don't you think that you owe it to yourself and your profession that you should assist

your directors to secure everyone who is a fit and proper person as a member of our society? If every member would make a resolution this year to get one good member, we should soon be on easy street, and, consequently, much more powerful than at present. In unity there is strength, not only in numbers, but in brains. There is no question in our minds that the larger we grow in number, the brighter will be our ideas; and, as this society is built on broad lines, there should be no end to our powers.

We feel that if the advantages of this society are shown to those outside our ranks, we shall not have any trouble in doubling our membership.

Our fee is very small; in fact, too small for the amount of work we have to do, and the benefits that are derived from it.

During the past year we have met quite regularly, the business that came before us was attended to as promptly as possible, and we think with entire satisfaction to everybody concerned.

The business that was left over from the last convention we spent considerable time on, as we felt that we should be absolutely sure that we were not making mistakes, which we cannot afford to do, especially as we are only in our infancy.

No. 4.

The circular that we sent to every member states the questions we have attended to this year. We will take the first, which is the proposed Workmen's Compensation Act. As you are aware,

this is coming before the House this session. This proposed Act covers one of the most important questions of the day. In fact, we believe that it is beyond the ordinary man to get at its true meaning, and how much we are liable for. Therefore, you will readily understand that we had to make a great number of inquiries before we could make up our minds how to advise you. The Act is composed of classes. The different trades are classified, according to the supposed risk. We are in the same section as elevator men and moving picture operators. We felt that we were in the wrong class, and decided to find out if our risk was more or less than the others in our section. In doing so, we went to several accident insurance companies for the different rates, and to our surprise we found that it cost five times more to insure our men than the men we were classed with. Therefore, we came to the conclusion that even if we were not in a class that looked good to us, we had better stay where we were, instead of being put into a more expensive class.

We have already mentioned the universal provincial sanitary by-law, and what your directors are doing in conjunction with the provincial officer of health, Dr. McCullough. We would like every member of this society, especially the different chairmen that we appointed to act with the different officers appointed by Dr. McCullough, not to let the grass grow under their feet, but to be up and doing. Unless all work, we shall not accomplish very much. We have not the time or space to state how many benefits you would derive if every village, town and city were under a proper sanitary by-law. Just think what it would mean to you and yours. I know you would be wondering where you would get the men to do the work, so now go to it and do your part.

No. 5.

The question of a permanent secretary and organizer is one which we have discussed at every convention, and it was the opinion of all that to put our society on a proper basis we must have a secretary. Your directors feel this way, and we are in a position to know how much good would come from having one. It is simply impossible for any one of us to devote the time required for any office that this society may honor us with, especially the office of secretary. The correspondence alone was 1,115 letters sent out, in addition to other clerical work. We are getting more correspondence every day, which must be attended to. As we are now about to try and better our condition throughout Ontario as per our charter, it will take a permanent secretary to handle the work. Your directors have taken everything

into consideration, and are aware that for a time it will be a hard pull financially. We decided, however, that we must have a secretary, and advertised in the Sanitary and Heating Engineer and several times in the daily papers. We received about fifty applications, of which we will recommend one for your acceptance. In appointing a permanent secretary, you must bear in mind that we are all morally bound to give him all the support possible by answering his letters promptly and forwarding all information possible that in any way affects the trade. In doing this, you will be assisting in no small way in building up the society. The small fee that we pay is not enough for us to do much with, so we will have to do our organizing at the expense of those who want to be organized, until we have a surplus.

In future pay your dues as promptly as possible. We shall be dependent on them, as we have no other revenue.

No. 8.

Standard Heating Specification.—We feel that for steam it is impossible to make one, as there are so many systems of steam heating. Hot water is different; it can be done, and we have drafted one with a leave clause attached, which we submit for your approval.

No. 9.

The Apprentice Code for the Province.—We disagreed on this matter to such an extent that we decided that each director should bring in his own form.

No. 10.

Technical Education.—We have spent a great deal of time on this question. In fact a committee went to New York to get information on it, and they will report to this convention.

No. 11.

Bulk Contracting.—This is another evil that has come before us during the last few years, and it will be more and more in evidence as your city grows and demands large buildings. We can only at this date ask you to discourage same in every manner possible. We believe that no bulk contractor should get the same price that you send to an architect. We believe that this can be arranged easily by those in the different towns, as it is not everyone that figures on this class of work. Let us get together on this matter.

No. 12

The endowment fund is one which we commend to every member of our society. At present we have only one subscription from Messrs. Noble & Eggett, of London, and they are to be congratulated on being the pioneers of this fund. We would ask others to follow their example.

No. 13.

Your present directors have been in office ever since we were incorporated, and we feel that it is too much to expect them to hold office continually. We also feel that it would be very bad business for all the present directors to drop out at once. We have tried to form some plan whereby our directors would be relieved every year, which we think would work out very satisfactorily. If a director proved satisfactory, he could be advanced by seniority, which means that he serves three years on the board. We would also suggest that the retiring director be made honorary director, as we did this year with Mr. W. Mansell, who retired last year.

By this method it would not be long before you could have directors all over Ontario. As our society grows and the permanent secretary becomes better acquainted with the work, the work would so adjust itself that it would not matter where they were situated.

No. 14.

At our last convention we appointed delegates to the National Convention, held in Montreal, to bring before them our position in reference to per capita tax, etc. They will report to you what action was taken. We would advise sending a strong delegation this year to Ottawa, to be able to make our case as strong as possible in reference to making the national body, as it was called, only an executive head.

No. 15.

In conclusion, we would ask every member of our society to enter into the discussion freely, as this is the only way we will be able to arrive at any proper decision. And we would also ask every member to discourage advances from travelers, etc., until such time as our business is finished.

Wishing the delegates and the society every success.

Specification of Hot Water Heating System Proposed For.

Boiler.—Provide and fit up in basement where shown on plan a number — hot water boiler with all attachments complete.

Foundation.—A suitable foundation to set boiler upon is to be provided by owner.

Smoke Pipe.—Connect the boiler to chimney in basement with a heavy galvanized iron smoke pipe, the same size as collar in boiler with damper in same. A flue of sufficient size to be provided by owner.

Blow-off.—A $\frac{3}{4}$ -inch heavy brass steam cock with hose end to be placed at low point in system for the purpose of emptying same.

Radiators.—Provide and set up cast-iron radiators, all to be of the pattern

sizes and heights given in the accompanying schedule.

Radiator Valves and Air Vents.—Provide and fit to each radiator a wood wheel nickel-plated heavy brass valve; also a wood wheel nickel-plated brass air vent.

Piping.—The radiators shall be connected to boiler with flow and return one hundred dollars. Too much could not be said of the generosity of these gentlemen in connection with their donation to the fund. He trusted that other members would follow the lead of these two worthy members. He also asked for suggestions in connection with the establishment of such sizes and so adjusted that each radiator will have a free and easy circulation of water with a low fire. Radiators containing 48 sq. ft. and less to have 1-in. piping, over 48 sq. ft. and under 100 sq. ft. to have $1\frac{1}{4}$ -in. piping and those with over 100 sq. ft. to have $1\frac{1}{2}$ -inch piping, all accompanying flow and return piping to be of the same size.

Separate flow and return piping to be run from boiler for ground floor radiators.

All piping to be of best manufacture of standard sizes, and to be put together in a strong, neat and substantial manner.

Fittings.—All fittings to be cast iron of a heavy beaded pattern and free from all defects.

Hangers.—All piping in basement to be securely suspended from ceiling timbers with strong adjustable hangers.

Floor and Ceiling Plates.—Where pipes pass through floors, ceilings or partitions above basement, the opening shall be fitted with nickel-plated floor and ceiling plates.

Covering.—All flow and return piping in basement to be covered with $\frac{1}{2}$ -inch hair felt and strong cotton securely sewn on, or sectional air cell asbestos lined covering.

Expansion Tank and Supply.—Provide and fit up above all circulation a heavy built galvanized iron expansion tank of ample capacity to allow for expansion of water, and fitted with long water glass and brass mountings. Tank to be connected to heating system with 1-inch expansion pipe. The water supply to system to be taken from nearest water supply and to be connected with a $\frac{1}{2}$ -inch service pipe having compression stop cock. From top of tank run up a 1-inch vapor pipe into roof space and just above tank branch in a 1-inch overflow pipe and carry same down to within two feet of cellar floor.

Generally.—The whole of the above work to be done in a neat and workmanlike manner. All material to be first quality and all to be thoroughly tested and left in complete working order.

Payment.—Payment to be made as the work progresses at the rate — per cent. of the value of the work done and

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DESCRIPTION OF PLATE 1700 E.

"Fleur-de-Lis" Vitreous China Syphon Action wash-down closet, "Sanisteel" non-sweating round corner tank, heavy copper lined, China lever handle, nickel-plated brass flush connection and nickel-plated seamless supply pipe, with stop valve; "Fleur-de-Lis" Pattern Seat and cover, with heavy nickel-plated cast brass post hinges, heavy cast brass floor flange, gasket and nickel-plated bolts. Finished in Quarter-Cut Oak, Mahogany or Circassian Walnut. Piano Polish.

List price as described, each\$25.00

Always specify finish required.

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They have been adopted by railroads, big hotels, large office buildings, factories and institutions and finally, by the discriminating householder. After all is said and done, it is natural that they should have achieved this wide popularity.

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After all is said and done, there is no question but that reliability is the first essential to the business of a good Sanitary Engineer. He can't afford to be unreliable in the conduct of his work, nor can he afford to be unreliable in his recommendations as to supplies. Nor can he afford to be unreliable as to time occupied in executing work.

While we cannot control the work that is done by any Sanitary Engineer, we can assure him of absolutely reliable service from any goods he may order from us, and of absolutely prompt deliveries from anything that may be ordered from stock. If it should so happen that an order is placed and the goods are not in stock and have to be made, we advise customers about it at once. We don't keep them waiting a week and then tell them that the stock has got to be made.

In every detail of our business, we aim to give close co-operation to the trade, and it is upon our service rendered in this regard that we solicit your business for the coming season.

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material deposited, the balance to be paid within — days after the completion of work.

———, Heating Engineer.

19 .

It is understood and agreed between the parties to this agreement that the said (insert name of heating engineer) is to be entitled to a lien on the goods, chattels and fixtures herein referred to until payment thereof, and that in default of payment the said (insert name of heating engineer) is to be entitled to immediate repossession thereof; the property in the said goods, chattels and effects to remain vested in the said (insert name of heating engineer) until complete payment therefor by the purchaser.

Signature.....

Signature.....

APPRENTICE INDENTURE FORM.

Read at the Recent Convention.

This Agreement, made this 19th day of March, 1914,

BETWEEN:

John Smith, Employer, carrying on Business as Domestic Sanitary and Heating Engineers, in the City of Toronto, in the County of York, of the first part.

AND:

Sam Jones, Apprentice, a son of the said Tom Jones, and the said Mary Jones, both the City of Toronto, hereinafter called the Apprentice, of the second part.

AND:

H. Hocken, Parent or Guardian, of the said City of Toronto, hereinafter called the party of the third part.

WITNESSED that the said party of the second part with consent of his Parents or Guardian places himself as an apprentice to the said party of the first part to learn the Trade or Business of Plumbing or Steam Fitting for the term of Four Years (4) commencing on the 19th day of March, One Thousand, Nine Hundred and Fourteen, during the whole of this said term of the said apprentice shall attend on all working days at the place of business of his said employer, from the hour of 8 o'clock in the forenoon till the hour of 5 p.m., with the exception of one hour for dinner, except Saturdays, when the hours shall be from 8 to 12 noon. And the said apprentice shall cheerfully obey the commands of his said employer, his secrets keep, his property protect, his interests by every means in his power promote, and prevent his employer's property from being purloined, made away with or damaged by others.

The said apprentice shall not lend the goods of his said employer nor remove any portion of them from the premises

of the said employer without his authority of consent. The said apprentice shall not frequent Bar Rooms where Intoxicating Liquors are sold, or places of Gambling, nor absent himself from the service of his said employer during working hours at any time without leave first obtained for that purpose, but shall demean himself towards his said employer as a good apprentice ought to do.

In consideration whereof be it said, the said John Smith, Domestic and Sanitary Heating Engineers of the City of Toronto, the party hereto of the first part, do hereby promise and agree to and with the party hereto of the second part or his Executors and Administrators that he will teach and instruct or cause to be taught and instructed in the trade or Business of Plumbing or Steam Fitting and will also pay unto the said party hereto of the second part or to whom he may appoint to receive same for the service of the said apprentice the several sums following, that is to say, for the first year of the said term the sum of Four Dollars (\$4.00) per week with a bonus of \$25.00 at the end of the first year. Second year, the sum of \$5.00 per week with a bonus of \$25.00 at the end of the second year. Third year, the sum of \$7.00 per week with a bonus of \$25.00 at the end of the third year. Fourth year the sum of \$9.00 per week with a bonus of \$50.00 at the end of the fourth year.

The apprentice also agrees for the above bonus to attend a Technical Trade or Night School and take instructions on Mathematics, Drawing and any subject that pertains to his trade for at least Two evenings out of the Week for Six Months in each year of this agreement, or if no such School exists he agrees to STUDY along the same line for the same time, and the Employer further agrees to furnish the Apprentice with trade books each year to the Value of Four Dollars.

If at the end of the First year and before the second year is started this agreement should prove unsatisfactory to either party the apprentice is to retire and his employer will pay him only half the Bonus money for that year or if found guilty of any act against the Criminal Code of Canada at any time during the Four years he may be discharged by the employer without any share of the Bonus.

Bonus money shall be placed in a Chartered Bank and held in trust until apprentice has completed his Four years as per the agreement between his employer. This money shall be paid into a joint account in the name of the apprentice, the apprentice, the employer, and the apprentice's Parents or Guardian, and shall be paid in instalments of one-half Bonus every Six Months.

Should the apprentice fail to comply with this agreement or fail to fulfil same this Bonus money shall then revert back to his employer, or should the apprentice die during his apprenticeship the half money then shall revert to his employer and half to Parent or Guardian, and should he complete his apprenticeship and become a Journeyman Plumber or Steam Fitter the money then shall revert to him at the expiration of the Four years along with the interest on same.

Should the apprentice after the first year be compelled to leave the employ of the party of the first part owing to Family moving to another country or death in family that would not permit apprentice to work for wage agreed upon, he shall be permitted to do so and that would cancel this agreement and any bonus money due would revert to his employer.

The apprentice shall be required to serve Six months on probation before entering into this agreement and if satisfactory on all sides at the end of this period, he shall sign for a period of 3½ years, which will constitute his Four and a half-years.

Should a grievance arise between employer and apprentice during the last three years of apprenticeship in which the apprentice considers he is not being fairly dealt with, or vice versa, the matter may be referred to an arbitration committee, composed of three, the employer, the apprentice's parent or guardian, the third to be mutually agreed upon by the above two and whatever decision is arrived at, to be final and binding subject to other clauses in this agreement.

And the said party hereto of the second part promises and agrees to and with the said party of the third part, his executor and administrators that he will during the whole term of Four years find and provide or cause to be found and provided for the said apprentice, good, proper and sufficient board, lodging, washing, medical attendance, suitable clothing and all other actual necessities and will do all and perform to the utmost of his power every act and thing which may aid and assist and complete the said apprentice to perform his duties diligently and faithfully during the whole of the said term.

And for the sure and full performance of all and every foregoing stipulation and agreement each of the said party hereto of the first, second and third part respectively covenants and agrees himself and themselves severally to the other, it being, however, distinctly understood and agreed between parties that the death of the said employer annul this agreement as though the same had become void by effect of time.

That if the apprentice shall at any

time during the said term be wilfully disobedient to the lawful orders or commands of his employer or be slothful or negligent or shall grossly misbehave himself towards the employer then in any such case, the employer may discharge the apprentice from his service, with consent of arbitration board as herein arranged and if discharged shall forfeit all Bonuses.

IN WITNESS WHEREOF, all the said parties hereto have hereunto set their hands and seals, the day and the year first above written.

SIGNED, SEALED and DELIVERED, in the presence of

On motion of H. Mahoney, Guelph, seconded by Geo. Kirtley, Toronto, the directors' report was referred to the resolution committee.

Vice-President Hicks read his report as follows:—

VICE-PRESIDENT'S REPORT.

Gentlemen:—Last year your president (then vice-president) recommended that we take steps to procure permanent headquarters, your directors took this matter up at an early date last year and from the response we got from the members throughout the Province it proved that the time was not ripe for such a venture, there being so few replies to our call for shares that it was decided to drop the matter for the present.

On page twenty-six of last year's annual report you will find a motion by Mr. Brittain, seconded by Mr. Caslake that we act on the suggestion of the Ways and Means Committee and procure a permanent secretary. Now Gentlemen I consider your officers have been particularly fortunate in securing the services of a gentleman whom you all know and than whom you must admit we could not have gotten a better man. We had many applicants but here is a man right on the inside who has the work of the association at heart, and who is well known throughout the Province either personally or by letter. His duties will be to keep all records and endeavor to increase the usefulness of the society and also to increase the membership, but I am afraid we will not be able to hold him more than a year unless we can devise some means whereby he can increase his value to us.

On page 28 of last year's annual report you will notice that we tried to procure Dr. McCullough to meet us in convention, but he was out of town investigating Dr. Friedman's supposed cure for consumption, but he has promised to meet us this year, and he is the man who can help us in our fight for better sanitary conditions throughout the Province in the way of getting uniform regulations, and you must admit it would be a boon to our trade if it be possible to get these

regulations, and I believe it, is if we keep at it.

Just imagine material used in Toronto too good to use in smaller towns. If it is not good enough for this city it should not be permitted in any part of the Province or Canada, is not life just as dear wherever life exists. I believe the chairman of the Sanitary Committee has some information along this line. But your



Harry Hicks, newly elected president

directors wrote to two hundred places for information with the result that we received a total of eighty-four replies, some even with stamped envelopes addressed for return.

Thirty-four of these letters were sent to members with 25 replies. The following are the places that did not reply: Ayr, Barrie, Brantford, Fort William, Galt, Hamilton, Ottawa, and Paris. These places are not villages and how are we going to build up this society if the members pay no attention to the secretary's letters? I would like to impress upon the members that this is very important. That all correspondence be answered promptly and your secretary will have half the work to do or in other words will be able to do twice as much work that will be effective.

Out of a total of eighty-four replies, only twenty-nine have by-laws and only twenty-four have inspection which is in many cases an excuse. The answers to the rest of the questions are included in the report prepared by the secretary.

Does this not show gentlemen, that there is something wrong and that it is up to us to keep up the fight for better conditions? You cannot expect the public to do it as they do not notice it until too late, that is when some epidemic of disease strikes their locality.

Wishing the society every success, I am,

Yours truly,
H. G. Hicks.

On motion of H. Mahoney, Guelph, seconded by A. H. Read, Toronto, the vice-president's report was referred to a committee of two appointed for same.

Chairman Brittain of the apprenticeship committee read his report.

To the Officers and Members of the Ontario Society of Domestic Sanitary and Heating Engineers.

Gentlemen:—

The question of competent men in our profession is getting to be more serious every day and no doubt some of the trouble lies with the employers themselves. The installation of plumbing and heating is being simplified and instead of better mechanics it appears to this committee that the average workman is not as good as in years gone by. Lack of control and shifting from one shop to another on the part of the apprentice is to a great extent the cause of poor workmen. Now, we as employers, should see that this state of affairs is altered, and adopt some system whereby our profession is placed on a higher standard. No doubt you have all gone into the form of indenture submitted to this body at our last convention and are prepared to take definite action this year so that we will be in a

The following is a form of bequest, to be used by any person wishing to subscribe to The Endowment Fund of The Ontario Society of Domestic Sanitary and Heating Engineers, that the Society may become a perpetual organization:—

"FORM OF BEQUEST."

I give and bequeath to The Ontario Society of Domestic Sanitary and Heating Engineers, a Corporation established by law in the Province of Ontario, the sum of

.....dollars

Signature

.....

..... 19

21

position to follow out a general plan in regard to apprentices for the Province.

C. BRITTAIN,

Chairman of Apprentices Committee.

On motion of F. Gentle, seconded by F. Rudow, Elmira, Chairman Brittain's report was referred to resolution committee.



No. 1, H. S. Brown, Brockville, and Wm. Mansell, Toronto; 2, Harry Hicks, Toronto, newly appointed President of Ontario Society; 3, F. R. Maxwell, Toronto, Past President, and Jno. Wright, Toronto.

above places. Our members, especially where there are several in one place, should have no trouble in getting their share of the good things, for in the protection granted to members of our society they have nothing to fear from anyone. I would ask the members to read and follow out their constitution and by-laws.

There was no directory compiled the past year on account of lack of funds. But any member wishing a list of the members can secure one from me upon request, until such times as your directors deem it advisable to issue an official directory.

In the matter of correspondence, this has been just as large as in previous years from my end, but still seems to need some attention from the outside point of view. I know that I have fallen down in some cases, but if my average was as bad as the most of the members we would have very few letters on file at all. I would request that every member make one resolution to-day, if no more, and say "From this day forward I will answer all letters received from the secretary upon receipt, as well as send him all my troubles to fix up." This matter, gentlemen, would be made easier from both ends if in places where there are several members you agree among yourselves upon a correspondent to the society, as, for instance, the secretary of local committees.

To facilitate organizing it has been proposed to divide the province into districts (similar to the medical health districts of the province), select a chairman or the society's representative for the district, and in that way endeavor

to increase the membership. I also must mention the neglect of some members to return their certificates for renewal. Will any who have not done so to date please attend to same at once.

In connection with the Canadian Society, as your delegate to Montreal, I have the following to report: Mr. Blyth and myself and about twelve others from Ontario who were in attendance brought before the convention the wishes of the Ontario Society, and, while at the start it almost repudiated affairs, we eventually came to a mutual understanding in the matter. Although we had the support of delegates of the Maritime Provinces and of the far West, and, although the report of the president, Mr. E. J. Yonge, of Calgary (who was not in attendance), recommended similar ideas to ours, our efforts were defeated at the hands of the convention upon the matter coming to a vote. We obtained our wishes, however, in another way. For instance, with regard to the per capita subscription of \$1 per member, they eventually accepted our offer, after being at deadlock for hours, upon my promising on behalf of the Ontario members to make good any deficit they might incur over the amount of the per capita subscription paid by Ontario, and up to what it would have been if Ontario had paid \$3 per member. While this looks like defeat on the face of it, I still believe it was the only way out of a bad situation, and thus effected an honorable settlement in accordance with her own ideas. With reference to the question of the Canadian Society becoming an executive body, Mr. Blyth and myself were appointed on the

nominating committee. In nominating men for office we selected for the president and secretary men residing in the next place where the convention was to be held, and, as luck had it, Ottawa had been selected. We thus lessened the expenses to be borne by the Canadian Society in having no traveling expenses to pay for the president or secretary. In this way we believe it will be possible to run the Canadian Society as an executive body upon a per capita tax of one dollar per member.

I again express my regret at not being able to gain all points, as per instructions from the Ontario Society, but I trust that it will only be a short time until all your desires are realized. All of which I beg to submit for your approval.

G. F. FRANKLAND, Corr. Sec.

On motion of W. Mansell, Toronto, seconded by R. G. Sturgeon, Peterboro. the corresponding secretary's report was handed to the select committee.

Chairman Sturgeon of the sanitary committee read his report.

Report of Sanitary Committee, Peterborough, Ont.

Ontario Society of Domestic Sanitary and Heating Engineers.

Mr. President and Fellow Engineers:—

In presenting my report this year, as chairman of the sanitary committee, I have much pleasure in assuring you that our work is starting to bear fruit, for in every city, town and village that I have visited I have received encouraging reports. In addition to verbal inquiry I have communicated with the M.H.O. of the different municipalities throughout

the Province asking for information relative to the following questions:

1. Have you a plumbing by-law in your municipality? If so, kindly mail us a copy.

2. Into what river or lake does the sewage of the municipality empty?

3. From what source do you obtain your supply of city water, river, lake or springs?

4. If your water supply is drawn from the same source into which your sewage is emptied, what distance is there between the intake and the outlet?

5. Is your sewage intercepted by septic, sedimentation tanks before entering rivers or streams?

6. Are septic tanks or beds under consideration by your council?

7. Have you a board of health? If so, how many members does it comprise?

From these municipalities I have had several prompt replies, and some places I have not heard from yet; replies take up considerable time where the M.H.O.'s do not exercise the authorities that they have; but when we get them in line, and they see what we are aiming at, things will take on another shape. When we have sufficient of this information collected we can then take up the work in an intelligent manner. We will then be able to have a meeting of the officers of the different municipalities and will be able to have the country in a more healthy shape by improving the sanitary conditions at large. I believe that we should have one code of by-laws for every municipality in the province. For I find in my travels where a town is allowed to install work in a slipshod manner by unskilled mechanics that it takes many years after a by-law is enforced to weed out the old work; and to educate the public to appreciation of work properly installed. I find that the cheap general contractor in these places is the worst enemy of our craft and of the public; they will take work at a stated price and will employ tinsmiths or anyone else that is engaged in the tin or hardware trade to install plumbing fixtures. So long as they can get the fixtures set on the floor, they think then their responsibility ceases, regardless of how the installation is made. I shall be glad when the day comes when we have one general code and proper officials to enforce the same. Our craft will then rank in the plane that it should—the highest and most intelligent profession for the benefit of mankind.

One cannot help but notice the interest that the different municipalities are taking in the sanitary science to-day. The matter of polluting rivers and streams has our provincial body in arms, and if any municipality has that trouble, it is only necessary to call the attention of the Provincial Health Offi-

cer to the matter and he immediately takes it in hand and in the majority of cases stays with the job until conditions are rectified.

Gentlemen, I move that this convention take expedient steps to prepare a provincial plumbing code, and to have the same placed in the Statutes of Ontario at the earliest possible date.

Thanking you gentlemen for the attention that you have given me, and trusting for your hearty endorsement of this policy,

R. G. STURGEON.
Chairman, Sanitary Committee,



R. G. Sturgeon, Peterborough.

On motion of T. Ferguson, Toronto, seconded by W. Brittain, Hamilton, the report of chairman of the sanitary committee was received and handed to the resolution committee.

R. G. Sturgeon, chairman of the sanitary committee, described his ideas in connection with his report and told of the different reports received from the medical health officers in answer to his inquiries for information on local sanitary conditions.

Report of Sanitary Committee No. 2.

The Medical Health Officer,
Oshawa, Ont.

Dear Sir:—

The Ontario Society of Domestic Sanitary and Heating Engineers are endeavoring to get information relative to the sanitary conditions of the towns and cities of Ontario. As chairman of the sanitary committee this work is allotted to me.

We would be pleased if you would answer the following questions, and if you can furnish us with any other information pertinent to the subject in hand we would be pleased to have it. Our object is to familiarize ourselves

with local conditions, to adopt a plumbing code suitable to all towns and cities, and the general betterment of sanitary conditions.

Have you a plumbing by-law in Oshawa? If so, kindly mail us a copy.

Answer.—Yes.

Into what river or lake does the sewage of the city empty?

Answer.—Lake Ontario, via east arm of marsh and natural outlet of Oshawa Creek.

From where do you obtain your supply of city water; river, lake or springs?

Answer.—Lake Ontario.

If your water supply is drawn from the same body of water into which your sewage is emptied, what distance is there between the intake and the outlet?

Answer.—Sewage empties into sedimentation tanks $\frac{3}{4}$ of a mile from marsh outlet and at head of marsh; the effluent is discharged into an easterly creek channel which winds through reed and rice beds to lake outlet. Intake is in a bay one-quarter of a mile west of creek outlet.

Are septic tanks or beds under consideration by your council?

Answer.—Subrefractive and sedimentation tanks now in existence. Bacteriological disposal for future consideration.

Have you a board of health? How many members?

Answer.—Mayor, three members, health officer.

We would ask you to write the answers on this sheet and return same to R. G. Sturgeon, Peterborough. Thanking you for the above information, which will be of great assistance to us in our work.

The Ontario Society of Domestic
Sanitary and Heating Engineers.
R. G. Sturgeon,
Chm. Sanitary Committee.

Report on Arbitration.

Secretary Frankland then read the report of J. A. Caslake, chairman of arbitration committee, who was not able to attend in person.

Collingwood, Ont., March 12, 1914.
To the President and Members of the
O.S. of D.S. & H.E., Toronto, Ont.

Gentlemen:—It is with great pleasure that I again report it has not been necessary to call a meeting of my committee during the past year.

J. A. Caslake.

Chairman of Arbitration Committee.

On motion of W. Brittain, Hamilton, seconded by T. Ferguson, Toronto, the report of Mr. Caslake, chairman of the arbitration committee, was received and put on file.

The meeting then adjourned to meet Friday morning at 9.00 a.m.

FRIDAY MORNING SESSION OPENED WITH A GOOD ATTENDANCE AND BUSINESS WAS DEALT WITH IN A VERY ACTIVE MANNER.

The Friday morning session opened promptly; the roll was called and showed several new arrivals.

President Maxwell asked the committees to get to work, and the meeting have their reports as soon as possible. He appointed T. Ferguson on the select committee in the place of John Wright, who was absent. He instructed the secretary to hand over all books, correspondence, etc., to the select committee for their perusal and also his report for their action.

To Meet in Toronto.

The president asked for the opinion of the members on the question of the annual meeting place, as announced in circular letter of March 7th.

Messrs. Brittain, Hamilton; Tipper, Brantford; Barnes, Sault Ste. Marie; Hoople, St. Catharines; Gibbons, London; and Gies, of Dundas, spoke on this question and the consensus of opinion was that Toronto should continue to be the place of annual meeting, with the dates of same similar to the present annual meeting.

W. Brittain, of Hamilton, moved, seconded by L. Gies, of Dundas, that the annual meeting be held in Toronto and at the same date if possible.

The president requested Messrs. Peter and Barnes, the auditors, to proceed with their duties, and report on same.

He appointed Mr. Spalding, of Preston, to act on the auditing committee in the place of Geo. Ross, of Brockville, who was absent on account of sickness.

E. H. Russell, London, read the report of the resolution committee.

Report of Directors For 1913.

Mr. Wm. Mansell, chairman,
Ett Russell, secretary.

Gentlemen:—Your Resolution Committee beg to report having passed the following resolutions:

Clause 1.—That we record our gratification at the quality of the membership and trust this high standard will be continually maintained.

Clause 2.—That the proposed Ontario sanitary by-law for the Province of Ontario be taken up and discussed in open convention.

Clause 3.—That this be accepted and that every effort be made to increase the membership with due consideration to the quality of candidates.

Clause 4.—Re Workmen's Compensation Act. That the report be accepted and that members make a direct charge in rendering all accounts of a sufficient percentage on the wages to cover assessment. That this clause be accepted.

Clause 5.—That the name of the proposed permanent secretary be submitted to the convention for final decision.

Clause 6.—Re manufacturers' discounts and London resolution. We would recommend that a strong delegation of ten or more of the best members from each part of the Province be appointed to attend on the manufacturers and jobbers, and that a meeting be arranged in the near future with the object of obtaining a proper understanding with regard (see list of names below) to quoting list prices to the public, and selling to the trade only.

Ross, Brockville; Sturgeon, Peterborough; Blythe, Ottawa; Britten, Hamilton; Makoney, Smith, Guelph; Anguish, Brantford; Russell Noble, London; Riddle, St. Catharines; Wolflux, Berlin; Rudon, Elmira; Peters, Stratford; Barnes, Sault Ste. Marie; Bennett, Galt; Bull, St. Thomas; Farrell, North Bay.



Harry Mahoney, Guelph.

Clause 7.—We would recommend that the annual meeting continue to be held in Toronto.

Clause 8.—That the hot water heating specification as submitted be adopted as far as possible throughout Ontario.

Clause 9.—That the apprenticeship agreement as submitted, be recommended for general use throughout the Province for those requiring same.

Clause 10.—That this society do all it possibly can to further and aid technical trade classes and instruction, and a vote of thanks be accorded the delegation to New York, Messrs. Clapperton, Legrow, Cooper and Mansell. That the essay from Lewis Legrow on technical training with regard to plumbing instruction be handed over for publication in Sanitary Engineer.

Clause 11.—Re bulk contracting. That this be discouraged as much as possible, that all architects be appealed to to refrain from asking for bulk tenders and that our particular trade always be figured separately.

Clause 12.—That this has been dealt with by convention and placed in the hands of trustees who will report.

Clause 13.—That the principle of one director retiring annually be adopted and selections also be made from places outside Toronto.

Clause 14.—Re delegation to Ottawa, that the recommendation of the directors be adopted, and that the attendance of as many as necessary shall be secured.

Clause 15.—That all members express themselves freely without restraint on the various matters before the convention.

Clause 16.—The Sanitary Committee's report be heartily commended and it is hoped that their successors will continue the work with equal vigor.

Resolution Committee.

Makoney, Guelph; Russell, London; Anguish, Brantford; Rudon, Elmira; W. Wasell, Toronto.

H. Mahoney, Guelph, discussed the reading of clauses in the directors' report, to correspond with the recommendations of the resolution committee.

H. Mahoney, Guelph, moved, seconded by J. Fullerton, Toronto, "that we take up the report of resolution committee, clause by clause, in conjunction with the directors' report."

Secretary read clause one of the directors' report (see report).

E. H. Russell read clause one of the resolution committee report, which was adopted by the meeting.

The secretary read clause two of the directors' report, (see report, also the information received in response to the letters sent out to the different places throughout the Province, inquiring about local sanitary conditions). (See data as compiled by the secretary).

E. H. Russell read clause two of resolution committee.

On motion of W. Brittain, Hamilton, seconded by A. Gibbons, London, the incoming directors proceeded with the work in reference to sanitary by-law for Ontario. Carried.

Messrs. Mansell, Toronto; Russell, London; Mahoney, Guelph, and Sturgeon, of Peterborough, spoke on this question, and they all agreed that this was one of the most important questions in connection with our craft, from the public point of view, and with the data on file. We should have no trouble in securing the passing of a Provincial Sanitary By-Law, when the question was brought before the Provincial Health Authorities.

H. Mahoney, of Guelph, requested that R. G. Sturgeon, Peterborough, chairman of the sanitary committee, give some information on the lines as received by him in answer to his request to the different local health officers along this line.

R. G. Sturgeon said his aim was to secure all the information he could regarding local conditions as to sewage, water and sanitary conditions, to show the need of a universal Provincial sanitary by-law to the Provincial Board of Health. He also described the method in which Peterborough secured their water supply, which was similar to many other places in Ontario, of using the sewage of the next town for water supply.

The president called the meeting to order again at 1.30 p.m.

The secretary brought to the attention of the president, the application of R. A. Sehl, of Waterloo, and read correspondence in connection with same.

On motion of R. C. Sturgeon, Peterborough, seconded by W. Brittain, of Hamilton, the application of Mr. Sehl, of Waterloo, was accepted, pending the report of the examination committee.

W. Brittain, Hamilton, asked if there were any examination to be passed by applicants. The secretary informed him that there was, according to their local conditions.

The president instructed the secretary to bring Mr. Sehl in, upon which the president introduced him to the meeting and welcomed him to the society. Mr. Sehl was received with hearty applause.

The report of the resolution committee was then continued. The secretary read clause three of the directors' report, (see report), and E. H. Russell read clause three of the resolution committee.

On motion of H. Mahoney, Guelph, seconded by G. Kirtley, Toronto, the clause of the resolution committee was adopted.

Secretary read clause four of the directors' report (see report), and E. H. Russell read clause four of the resolution committee. On motion of T. Maxwell, Toronto, seconded by Wm. Mansell, Toronto, the clause of the resolution committee was accepted.

L. LeGrow, Toronto, moved, seconded by A. H. Bald, St. Catharines, an amendment to the motion that this matter be taken care of in overhead expenses. The amendment was lost, and the motion carried.

Messrs. L. LeGrow, Mansell, Russell, Haslett, Sturgeon, Hicks, Hoople and Mahoney discussed clause four.

L. LeGrow claimed as soon as rate was set by Government, it would be necessary for all the members to add the amount that each would pay to their

overhead expense, as one more item of cost of doing business. So that it would be included in each estimate which we gave.

J. R. Haslett, London, hoped that we would be able to copy the system in use in the Old Country, where they place a stamp supplied by the Government on each account for the required amount.

R. G. Sturgeon suggested the use of a rubber stamp, with the words: "For the Workmen's Compensation Act," and the required amount shown on the bill.

E. H. Russell, London, claimed the only right and proper method of taking care of this new expense that was to be placed upon them by the enactment of the Compensation Act, was to charge same to customers on each account as it was rendered.

C. F. Frankland contended that Mr. LeGrow was right, in connection with contract work, where an estimate was made of the cost of the job, and Mr. Russell was right, where day work or jobbing was concerned.

Secretary read clause five of the directors' report, (see report), and E. H. Russell read clause five of the resolution committee.

On motion of W. Brittain, seconded by T. Fullerton, the report of the resolution committee was adopted.

The Office of Secretary.

The president read a letter as received from the Toronto committee in reference to the use of an office by the permanent secretary. Also a recommendation was read from the Board of Directors, and the executive committee, with the name of the proposed secretary.

Letter From Toronto. Comm re Office.

Toronto, March 17, 1914.

G. F. Frankland,

Secy. Ont. Society D.S. & H. Engineers,
Dear Sir:—

At the last regular meeting of the Toronto committee, the communication from the directors of the Ontario society in reference to the appointment of a permanent secretary, was considered, and it was unanimously decided to place our executive room in the Canadian Foresters' Bldg., (Room 507) at the disposal of the directors, as a headquarters for said secretary, free of charge for the term of one year.

J. FULLERTON,

Secretary for Comm.

H. Mahoney moved, seconded by L. LeGrow that the offer of the Toronto committee for the use of their office, and the recommendation of board of directors, in regards to appointing G. F. Frankland as permanent secretary be accepted. Carried.

Secretary read clause six of the directors' report, (see report), and E. H.

Russell read clause six of the resolution committee.

H. Mahoney, moved, seconded by T. Smyth, Toronto, that the report of the resolution committee in reference to manufacturers be adopted. Carried.

Messrs. Mansell, Hicks, Brittain, Clapperton and Mahoney discussed this clause.

The secretary read clause seven of the directors' report (see report), and E. H. Russell read clause seven of the resolution committee. On motion of W. Brittain, seconded by R. G. Sturgeon, the report of resolution committee was adopted.

J. R. Haslett thought that the Toronto committee should not bear the expense of the annual meeting each year. W. Brittain, of Hamilton, took the same view. The president said that the Toronto committee could bear the expense until they complained.

The secretary read clause eight of the directors' report, and E. H. Russell read clause eight of the resolution committee.

On motion of H. Mahoney, seconded by L. LeGrow, the report of the resolution committee was adopted, and a copy of specification will be sent to every member.

The secretary read clause nine of the directors' report and E. H. Russell read clause nine of the resolution committee.

On motion of W. Brittain, seconded by W. Albert Tipper, the report of the resolution committee was adopted, and the copy of the agreement will be sent to each member.

W. Albert Tipper thought that the resolution committee should be congratulated on arriving at a solution of the much heckled question of apprenticeship agreement.

The secretary read clause ten of the directors' report and E. H. Russell read clause ten of the resolution committee.

On motion of J. R. Haslett, seconded by Geo. Kirtley, the report of the resolution committee was adopted as read.

Wm. Mansell suggested that the report on technical training by L. LeGrow be read again, for the benefit of those members present who were absent on Thursday. Mr. LeGrow read the report.

The secretary read clause eleven of the directors' report and E. H. Russell read clause eleven of the resolution committee.

On motion of R. Sturgeon, seconded by H. J. Conn, St. Catharines, the report of the resolution committee was adopted.

Messrs. MacDermid, Stratford, and Russell, of London, both gave their views on this question.

The secretary read clause twelve of the directors' report and E. H. Russell read clause twelve of the resolution committee. This clause was accepted without motion. H. Mahoney said they would



No. 1, J. R. Haslett and C. Needham, London Delegates; No. 2, G. F. Frankland, Toronto, and W. Brittain, Hamilton Delegate; No. 3, J. D. Anguish and W. Albert Tipper, Brantford Delegates. The two inserts are J. T. Aggett and T. Hutcheson, Toronto.

be pleased to receive money for endowment fund from now on.

The secretary read clause thirteen of the directors' report and E. H. Russell read clause thirteen of the resolution committee.

On motion of W. Brittain, seconded by Wm. Mansell the report of resolution committee was adopted.

Messrs. Mahoney and Hicks discussed this clause.

The secretary read clause fourteen of the directors' report and E. H. Russell read clause fourteen of the resolution committee.

On motion of G. Kirtley, seconded by T. Maxwell, the report of the resolution committee was adopted.

H. Mahoney drew the attention of the members to the necessity of a large delegation attending the convention of the Canadian Society to be held in Ottawa in June. "We must keep in mind the fact of not allowing the expenses to become too heavy," he said.

The secretary read clause fifteen of the directors' report and E. H. Russell read clause fifteen of the resolution committee.

On motion of H. Mahoney, seconded by J. Fullerton, the report of the resolution committee was adopted.

The secretary read clause sixteen of the directors' report and E. H. Russell read clause sixteen of the resolution committee.

On motion of H. Mahoney, seconded by G. Clapperton, the report of the

resolution was adopted in reference to the sanitary committee report.

On motion of H. Mahoney, seconded by J. Fullerton, the report of resolution committee was adopted on the whole.

The secretary read the report of the select committee.

Select Committee.

Your committee beg to report that they have looked over the correspondence and find that your secretary has dealt with same in proper manner, also copies of all letters placed on file.

Also that the books of the society were examined and found in business-like order.

Signed, H. A. BALD.

We would recommend that another effort be made to secure the outstanding certificates. Also that the society be divided into districts, that this matter be discussed at this meeting and that the secretary be empowered to form same if at all workable, and report to the next annual meeting.

We also recommend that your secretary be given a hearty vote of thanks for his devotion and untiring labors to the vast interests of this, your society.

Signed, H. A. BALD,

THOS. T. O. FERGUSON.

On motion of Wm. Mansell, seconded by J. D. Anguish, the report of the select committee was accepted.

On motion of H. Mahoney, seconded by Geo. Cooper, clause one of select committee report was adopted.

On motion of Wm. Mansell, seconded by H. A. Bald, clause two of the select committee was adopted.

President Maxwell asked those members, who had not returned their old certificates for renewal, to please attend to same at once.

T. Ferguson reminded the president that the select committee report of the outstanding certificates, referred to those certificates of members who had resigned, and had not returned their certificate and constitutions.

Auditors' Report.

Secretary read auditors' report:
Toronto, March 20.

To the President and Members
of D. & S. H. E.

We, the undersigned appointed auditors of your Society, have audited the books for the year ending Dec. 21, 1913, and have found same correct. We must express our appreciation of the able manner in which the most important books of this Society have been kept up to date by the present secretary.

E. H. BARNES,

H. J. PETER,

W. A. SPALDING.

On motion of W. Brittain, seconded by E. H. Russell, the auditors' report was accepted as read.

A Committee Appointed.

The secretary read the report of the committee in charge of the vice-president's report.

This committee recommended the adoption of the vice-president's report, and also recommended the appointing of a committee of three to advise the secretary, and to devise ways and means to operate the vice-president's suggestions for the mutual benefit of the members, this committee to have full control of the matter, the committee to be appointed by the president.

This was submitted by H. A. Bald and G. E. B. Grinyer.

On motion of G. E. B. Grinyer, seconded by R. Sturgeon, the report of the committee on the vice-president's report was accepted.

Legislation Report.

The secretary read the report of chairman Blyth, of the legislation committee, which he had forwarded by mail as he was unable to be present.

Legislative Committee Report.

Ottawa, March 2, 1914.

To the President and Members
of Ontario Society,

As chairman of the legislative committee I have to report as follows: Legislation has been passed by the Ontario Legislature in which strict regulations are to be enforced as to the building, setting and mountings, of return tubular steam boilers where same are under high or low pressure with respect to their safety, also limiting the use of valves on high pressure work to such as are officially approved by the Ontario Government.

With respect to the above I would suggest that the executive committee be asked to obtain copies of this legislation and to see that it is placed in the hands of every member of the craft.

Legislation will come before the present session of the Ontario Legislature dealing with the workmen's compensation. What fixed form this will take is unknown at the time of writing.

This measure when it becomes law is very important and copies of same should be placed in the hands of every member.

The main point to be kept in mind is this: The compensation for injury is eventually to be paid by the people. Every manufacturer and employer of labor will have to consider that there will be added to his annual expenses of doing business, the cost of protection to him against damages which are liable to be claimed from him under the working of this law.

I would suggest that a committee be appointed to look after this matter and to estimate for the benefit of the employers, what percentage will be added to the cost of doing business under the compensation act, and when they have carefully worked this out, that their

findings on the matter be put in writing and distributed among the members of the Association. The plain effect of this legislation bearing directly on every one of us is this, that we will have added expense and consequently will have to obtain more for our work.

This applies to every member, whether his payroll is \$1,000 a year or \$50,000 a year. One of the aims of our Association is to obtain legislation which will bring into effect the enforcing of a uniform plumbing by-law throughout the whole province. Every effort should be made by our Association towards this end and the matter kept constantly before the members of the Government and Legislature.

All of which is respectfully submitted.

J. T. BLYTH,

Chairman of Legislative Comm.

On motion of W. Brittain, seconded by G. Clapperton, the report of the legislation committee was received, and handed to the incoming board of directors for action, especially in regard to the first clause in connection with the Ontario Steam Boilers Act.

The president then appointed the following gentlemen to act on the nomination committee, Messrs. Mansell, Russell, Bald, Peter, and W. Brittain.

J. R. Haslett asked if it would not be wise to formulate a policy on the behalf of the society, to lay before Doctor McCullough when he appeared before the society.

Messrs. Haslett, Sturgeon, Mahoney, Brittain and Russell spoke on this question.

E. H. Russell thought it would be an opportune time to lay before the doctor their wishes in regard to a Provincial Sanitary By-Law.

J. R. Haslett said that the necessary changes should be made to the "Act respecting to the Public Health," of 1912, so that in all municipalities a sanitary engineer would be a member of the local board of health.

It was agreed that Messrs. Haslett and Russell of London, should lay their ideas before Doctor McCullough.

New Business.

President Maxwell declared the meeting opened for new business. The recommendation of the board of directors, and the executive committee as referred to the annual meeting for adoption was read:

"That the annual fees payable to the Ontario Society be changed from five dollars to ten dollars, and where the words five dollars (\$5.00) appear in the by-laws, at clause No. 19 (fees) be changed to read ten dollars (\$10.00). See page No. 15 of Constitution."

On motion of H. Mahoney, seconded by J. E. Fullerton, the recommendation of the directors and executive committee was adopted.

The secretary read an invitation from the James Robertson Company to visit their show rooms on Saturday morning.

On motion of E. Holland, seconded by A. Gibbons, the invitation was accepted.

On motion of R. Sturgeon, seconded by R. J. Haslett, a vote of thanks was given to the "Sanitary Engineer," for the many courtesies and assistance extended to the society. This was carried with applause.

The president extended to Editor Newsome, of the Sanitary Engineer, the vote of thanks from the Society for his assistance to the society, and the craft as a whole.

Editor Newsome replied, expressing much pleasure on behalf of the MacLean Publishing Company, for the vote of thanks from the society. He wished to impress upon the members the willingness of his company to assist the craft at all times.

The secretary read a communication received from secretary-treasurer Holloway, of the Canadian Society of Domestic Sanitary and Heating Engineers, requesting an assessment of two dollars per member from the Ontario Society, and also the number of delegates that would attend the coming convention in June, to be held in Ottawa.

Report From Canadian Body of Domestic Sanitary and Heating Engineers.

Ottawa, February 24, 1914.

Mr. G. F. Frankland,
1093 Bathurst Street.
Toronto, Ont.

Dear Sir:—The annual meeting of the Canadian Society of Domestic, Sanitary and Heating Engineers will be held in Ottawa in the second week of June of this year, June 9, 10 and 11. You are aware that your association is entitled to send accredited delegates to the number as laid down in the constitution and that it is expected that as many more members will come as can make it convenient.

The probability is that this is the last annual meeting of the association as now constituted. At the last annual meeting a very large proportion of accredited delegates were instructed to see that the Canadian association be made a purely executive body. This was not carried, but I am in receipt of definite word from several of the Provincials that it is still their opinion that the Canadian National affairs could be better handled by a purely executive body. Following is a list of the activities of the national body and when they are considered, the opinion that these should be handled by a purely executive body will be more strongly confirmed.

1. Dominion sanitary laws if any.
2. Relation with manufacturers and jobbers.
3. The organization of Provincial associations where not now organized.
4. The taking up with Dominion Government the matter of having all plumbing and heating on Dominion contracts let separately.
5. The receiving of reports from each Provincial association, (or local otherwise) covering the year's business and all such matters as pertain to the advancement of the trade in pamphlet form to be distributed throughout the different Provincial associations.

Your opinion on this subject would greatly oblige me. Whatever the outcome, let us strive by mutual co-operation to make this meeting one of credit to ourselves. Kindly let me know the number of delegates you may expect to send. It is most urgent on this important occasion that all proxies should be duly sent in.

I am enclosing copy of constitutions and by-laws.

C. P. Holloway

Secretary to National Association.

The secretary read from his report of the last convention held in Montreal, regarding the question of per capita, and the promise he made for the Ontario Society in connection with same.

On motion of H. Mahoney, seconded by G. Clapperton, the directors were given power to defray any expense of the Canadian Society Convention—but not over two dollars per member.

Secretary read letters pertaining to clause (I A) of directors' report.

H. Mahoney moved, seconded by T. Ferguson, that any opinions received in reference to the questions asked, be left to the incoming directors. Carried.

The president announced that on motion of London, seconded by Guelph, the customary donation of five dollars would be made to the caretaker for services rendered. Carried.

The question of appointing delegates to the Canadian Society Convention to be held in Ottawa in June was then taken up.

On motion of H. Mahoney, Guelph, seconded by A. Spalding, Preston, the president and secretary were elected as delegate, their expenses to be paid by the society, and the balance of required number of delegates to be appointed by the directors.

The New Officers.

The report of the nominative committee was read.

Nomination Committee Report.

Mansell, Russell, Brittain, Ball, T. Maxwell.

New Directors Appointed.

H. Hicks, President, Toronto; E. H. Russell, London; Geo. Clapperton, Toronto.

Auditors.

H. J. Peters, Stratford; G. Ross, Brockville; T. Maxwell, Toronto.

Chairman of Committees Sanitary.

R. G. Sturgeon, Peterborough.

Heating.

E. H. Barnes, Sault Ste. Marie.

Arbitration.

J. A. Caslake, Collingwood.

Legislation.

J. T. Blyth, Ottawa.

Apprenticeship.

W. Brittain, Hamilton.

Examination.

C. H. Hoople, St. Catharines.

Educational.

Geo. E. B. Grinyer, Guelph.

Recommend quarterly meetings of Board of Directors and Chairmen of all committees to meet quarterly with the directors.

On motion of T. Maxwell, seconded by L. LeGrow, the report of the nominating committee was received and adopted.

Wm. Mansell moved, seconded by W. Brittain that a copy of the report of the annual meeting be sent to every member. Carried.

President Maxwell requested the newly-appointed directors to kindly withdraw and elect their officers.

President Maxwell requested H. Mahoney to take the chair.

The new directors having announced their officers for 1914, chairman Mahoney requested Messrs. Mansell and Maxwell to escort the new president, Mr. Harry Hicks, to the chair, upon which chairman Mahoney welcomed him, and handed over the gavel.

President Hicks announced that, while he was not a chairman by profession, he promised to do the best he could for the society. Messrs. Mansell and Maxwell then escorted vice-president Russell, of London, to his position to the tune of "He is a Jolly Good Fellow."

Messrs. Mansell and Maxwell then escorted treasurer Clapperton to his position to the tune of "See the Sanitary Engineer Passing By."

F. Maxwell moved, seconded by R. Sturgeon, that the retiring directors become honorary directors. Carried.

F. Maxwell moved, seconded by W. Brittain that the members meet at 10.00 a.m., at James Robertson show rooms Saturday morning.

On motion of W. Brittain, seconded by R. Sturgeon, a hearty vote of thanks was extended to the late directors.

On account of some unforeseen circumstances, Dr. McCullough could not attend. It was therefore moved by F. Maxwell, seconded by T. Maxwell, that the incoming board of directors draft up

our ideas and present them to Doctor McCullough. Carried.

No other business coming before the meeting, the president adjourned the third annual meeting on the motion of W. Brittain.

Report of Delegation That Visited New York in Regards to Technical Training.

On February 28th, a delegation consisting of Messrs. Mansell, George Cooper and L. LeGrow, left Toronto on the 5.20 C.P.R. train for New York.

After a comfortable night we arrived at the Breslin Hotel, New York at 9 a.m. Sunday morning. Welcomed by Mr. G. Clapperton (who had preceded us) to a good breakfast, and the whole of New York City with a great display of Nature's laws, one of the biggest snowstorms in its history visiting it and us. After a short visit to the New York Aquarium it was found necessary to stay indoors all Sunday, much to Mr. Mansell's disappointment in not being able to attend church.

Monday morning found traffic demoralized and the snowstorm going strong. Having met Mr. Wall, of Montreal, J. L. Mott's Canadian representative, and explained to him our mission, he soon delegated Mr. Isley, of J. L. Mott Co., to accompany us to Brooklyn to visit a trade school. A quick run underground brought us to Brooklyn, N.Y., where we met the principal of the school, who very kindly received us and gave us all the information at his disposal, explaining to us that his was more of a high school taking up vocational work and technical training as an incident to its main work. Their technical work consisting of some night classes in practical work in the different trades, but that their main work was the preparing of students for University work. Received the names and directions of the real technical schools, and accompanied by Mr. Isley, we journeyed back to New York, found Mr. Wall and the whole party and retired to a Bohemian restaurant. It being now late afternoon Mr. Mansell and George Cooper retired to their hotel for a sleep on a full stomach and tired legs. Mr. Clapperton having some private business attended to it, but LeGrow, not being either sleepy or hungry, went to the corner of Broadway and 32nd Street and watched how the people came from the factories, and how they went under the ground, on the ground and above the ground, and, open-mouthed, wondered what became of them. Truly this is a most cosmopolitan city.

The delegation having again united, led by Mr. Wall, retired to a Dutch cafe. After feasting on Dutch dishes with French names, and entertained by sweet girls and pretty music, we were given

tickets and told to go to the Hippodrome, that is Cooper, Mansell and LeGrow (Mr. Clapperton having some more private business). A wonderful show, a wonderful building and three amazed Torontonians. 11.30 p.m. suggested by Cooper that we visit Rector's famous eating house on Broadway. Going into the main dining room a liveried lackey tried to grab our coats and hats, but Mansell, being a very old and much experienced traveler caught him with the remark that we did not want to dine so much as we wanted to see the sights. "Have you gentlemen reserved a table?" Not us, but a Canadian half-dollar opened the lackey's eyes, and with a "This way, gentlemen," we were directed to the ball room supper floor; having left our coats and hats we were now ready for an introduction to New York society. Climbing the carpeted stairway, to the sounds of music and dancing, we were escorted to a small table amongst many gay parties. Instantly a waiter appeared, George Cooper acting the host. Three bottles of ginger ale and club sandwiches.

"Look at the slit in the girl's dress!" "Is that the tango?" "Say, waiter, what is that?" "That is the turkey trot." "Where are the turkeys?" "They are not turkeys, they're chickens." "Is that the hesitation waltz?" "No, that is the bunny hug." "What is your order, gentlemen?" "Have you any post-cards? I want to send one home to my wife."

12.30 a.m. received our coats and hats, wended our way to our hotel, some of us having a bath, all satisfied that the eighty cents we spent was worth it.

Tuesday morning, light breakfast of grape fruit, porridge, ham and eggs, rolls, coffee and pickles. Mr. Clapperton having made arrangements with the Mott people to have a representative meet us at the station at Yonkers. Leaving the New York Central Railway Station at 8.45, arrived at Yonkers at 9.30, being met by Mr. Reed, of the Mott Company. A brisk walk, we arrived at the Saunders' Trade School, being introduced all round by the principal, Mr. Eaton, who immediately became our friend and gave us full information and conducted us through a magnificently-equipped building, the gift of Mr. Saunders, of stock and dies fame. Naturally gravitating to the plumbing department, we were introduced to Mr. Rose, the practical instructor of plumbing. There we saw a well-equipped room and a number of boys learning the plumbing trade, all tools and material necessary to equip the building being at their disposal. Their construction material consisted of complete fixtures in all conditions of erection. Boys were taught the "Why" of things and practical demonstration was given.

These boys were doing the practical work of plumbing and also making drawings of their work. They were also required to devote some time each day to arithmetic, drawing, chemistry, applied mechanics, and a general course of information, everything bearing on their future work, and the instructor informed us that when these boys started in the shops as helpers they were so proficient that they very soon graduated into good mechanics and very capable and careful men, for neatness was no mean part of their curriculum.

Having received a great deal of technical information and literature we said good-bye and left Yonkers at 12 o'clock for New York. Arriving in New York found Mr. Wall and we all went to have a French dinner at the best French restaurant in New York.

At 2 p.m. started for Harlem Vocational School, corner of 138 Street, and accompanied by Mr. Isley, arrived there at 3 p.m. by the underground passage. We were cordially received by Mr. Chas. J. Pickett, the principal, who gladly showed us through this well-equipped building, the largest we had visited. All trades were in evidence from blacksmithing to electrical work. Their plumbing construction room being well equipped with all modern necessities. Some joint-wiping and lead-work here done by boys of fifteen years of age, was very fine and showed marked results from their training. They laid out all their work in small books, which they took pride in, glad to show their books to us, which were a marvel of great neatness and ability. Boys were accepted in this school with or without much previous schooling, and, as the principal explained, they were there to give the boy that which he showed himself adapted for. The whole course of training is directed along lines of the most benefit to him, and any boy studying for two years, and who shows proficiency is granted a diploma. The question of prizes or scholarships is not commended, but the individuality of the boy and his adaptation for his future work are carefully studied.

After getting well acquainted with the school and its work we started back to New York on the elevated road. LeGrow wanted to see Brooklyn Bridge. Back to the hotel, a good wash-up, another sleep by Cooper and Mansell, then to an Irish restaurant, by name, "Sharkey's." This was the finest of them all, every waiter in the place a born Irishman and every one of them speaking Jewish. Mr. Wall conducted us to a table where we could see what was going on, he, himself, facing all entertainers, with LeGrow having to turn his head every time a note of exclamation was uttered. In one of these turning movements, the waiter, think-

ing he was finished, carried off his dinner. The entertainment here was what is known as "Cabaret," singing on the platform, singing around the tables, and standing back of the guests singing, and with all its foolishness there was nothing objectionable to Cooper. After dinner Mr. Clapperton attended to some business with Mr. Wall. LeGrow, Cooper and Mansell started to find a theatre where Shakespearian plays were produced, the nearest thing to a tragedy was when Mansell saw an old painting singing "I Love You." Shortly after we retired to the hotel.

Next morning visited the shipping interests, boarded an Atlantic liner, saw that everything was in good sailing order. Paid our respects to Pier 61, and started for dinner. LeGrow knew a place where the finest meals in New York were served. "We'll go with you" and of all 10-cent meals this was the best, so good was it that Mansell went into the rotunda of a good hotel to have a sleep.

A shopping trip proposed by Cooper, who wanted to buy his wife a pair of Tango boots, we walked all over 6th Avenue, 7th Avenue and 8th Avenue, and back to 5th Avenue, where they were selling \$4 boots for \$16. We finally finished up our shopping and decided to come home to Toronto while we had car fare. Mr. Clapperton following the following day with more store goods than he had taken with him, which he found out when the Customs officer wakened him at one o'clock in the morning and collected \$17 duty.

Attached herewith is full technical literature which is at your disposal.

ESSAY FROM LEWIS LEGROW. The Value of Technical Training In Its Relationship to Plumbing Construction.

Numbers do not make a nation—neither does material prosperity necessarily define the characteristics of its people. To discover its source of influence and power we must look under its activity and try to find its source of life. From its national beginning the Dominion, provincial and municipal governments have very considerably and very willingly organized and established what are commonly known as seats of higher education, particularly fitted for the training of professional men, such as doctors, lawyers, ministers, teachers, etc., and while these professional men are a necessary part of our material life and a great force for national productiveness, still if the mills of higher learning are turning them out faster than the economic conditions will allow them to become an asset in national life, the very nature of their training tends to prevent them from becoming hewers of wood and drawers of water, and they may become

parasites on the body politic. The opposite condition has existed in the case of many others, opportunities for public school education have been very limited and we find them starting work very young in life, and because of the lack of opportunity in many cases, are not capable of doing anything but to become hewers of wood and drawers of water. Then there is another class who receive a good public school education, but who do not have any definite policy as to their future life, and who cannot take the higher courses of learning, and drift unconsciously into different occupations, indifferently trained for them, but by persistent stay-at-it-iveness become good mechanical and good business men, but lacking the technical or vocational training that should have been their opportunity. At the present time the people are beginning to discover that vocational training should start in the public schools, that the student should be trained for his life work from the beginning and as he advances he may have the opportunity of learning the technical part of the business, that he may discover what would be suitable for him, and in which line he may enjoy his work. For this purpose training schools are being organized and equipped in an up-to-the-minute manner, with instructors and necessary machinery, so that the student may at the age of sixteen years know just exactly what business he desires to follow, and be able to apply his instruction intelligently to it. Provision will also be made for those who cannot take the full courses of day training, but will be able to attend evening sessions and receive the same instruction as the day student.

The question has often been asked, "What are the ideas of organized labor to this movement?" We need only to look at the relationship of organized labor to technical training to discover that they are very enthusiastic in wanting the very best that it is possible for their members to receive, recognizing that education produces ability and progressiveness when properly received.

What are the ideas of the employer to technical training? Some may say that you are training boys to become business men as well as mechanics and that a boy trained in the theoretical part of the business will not long be satisfied in being an employee. Granted that this will be the case, the well trained technical boy will then become a better business man because of his training, he will recognize that to be successful in business it will require all his knowledge to be an honest competitor, and because of his better technical training he will become a better business man. No person need ever fear for his business success from competition from a person who knows and who knows why he

knows. If we cannot stand this kind of competition it will show to us that we need the training that the other had received.

The great universal affliction of the human race is lack of brains. The very great majority of people are slow of understanding, and are, besides, so coated with prejudices, so fortified by false pride and so bound by actual ignorance that it is difficult to penetrate their shells with an idea that takes root in action. Some of us want to be great and quickly perform great things, not contented to work carefully and persistently to develop our ideas and our personalities, forgetting that before we are great we must be good, we must be simple, we must be common, we must be



*Lewis LeGrow, Toronto,
of Ontario Society.*

independent of all the flummery and foolishness of business life, never forgetting that the only things that will count will be an absolute fair deal to man and boy. And in this relationship never forgetting that life is a long time, but that eternity is immeasurable, and that anything that we may do to advance the joy of life in making people contented and happy in their chosen work will help to develop their character, which is in each one of us, waiting for its development, and if we can encourage boys to attend technical courses it is for us to do so, even giving them the privilege for afternoon attendances without loss of pay, realizing that the boy will respond to kind treatment and appreciate what is done for him.

POOR PLUMBING.

"The plumbing in Hamilton is most unsatisfactory," said S. Brittain, introducing a deputation from the master plumbers, comprising G. A. Rick-

etts, G. Halerow and Webber Harris, who asked that the following additions and alterations be made to the building by-law:

"That all fixtures installed inside a building shall be separately vented, closets to be vented if three feet or more from stack, such vent to consist of either cast iron, lead or galvanized wrought iron, and not less than two inches in diameter.

"That four-inch lead bends and four-inch lead pipe be not less than what is known to the trade as eight-pound lead. Baths, sinks, wash trays and waste pipes to be not less than one and one-half inches in diameter, all lead pipes to be the same size and weight as the waste pipe. All waste pipes to be either cast iron, lead or brass; vent pipes to be not less than one and one-quarter inches in diameter, the material to be either cast iron, lead or galvanized wrought iron.

"All alterations or renewals in old buildings to comply with the plumbing by-laws, if possible; otherwise subject to the approval of the plumbing inspector.

"The water test to be applied when the job is completely roughed in; a final test of smoke after the fixtures are in position."

The matter will be considered.

Editorial Comment.

No doubt Mr. Brittain and his fellow craftsmen are right in taking up such an important matter. We, as a craft have been too slow in moving in such matters, and the various city councils need wakening up. They seem to think any old kind of sanitary engineering will do these days. For a new country, such matters should be better and more vitally considered, and it is only by the craft keeping everlastingly at it that anything will be done, and we wish to compliment our brother craftsmen for moving in the matter at Hamilton. To think that a city like Hamilton is allowing such botch work as we know is being installed, is, to say the least, scandalous. We have examined the plumbing by-laws of Hamilton, and must say, they are a joke, and would even go further than Mr. Brittain by stating that a new set of by-laws be drafted upon up-to-date lines, which would be of sufficient value so as to safeguard the lives of the citizens of Hamilton, in a more efficient manner than it is possible to do under the present existing by-laws.

FOR SALE

FOR SALE.—PIPE MACHINE AND DIES 1" to 4", fitted for hand or power, including two belts (or without belts), used very little, cost \$170, will sell for \$100. Apply Box 88, Barrie. (8)

Toronto Society as Host to the Ontario Society of Domestic, Sanitary and Heating Engineers

Each Delegate Present at the Recent Convention of the Ontario Society Was the Guest of the Toronto Branch—A Splendid Repast Was Served and a Fine Entertainment Provided.

CANADIAN Night was one never to be forgotten. The Toronto branch entertained the delegates to the recent convention. The day had been one of hard work all through and such an evening was thoroughly appreciated by one and all. A splendid orchestra was in attendance under the able directorship of E. Jules Brazil, the society's official entertainer, and at various intervals the whole crowd joined in singing such songs as :—

Oh, we'll sing a little song of Toronto,
It's the best old town we know,
Oh, Toronto, where fairest maidens
grow.

If you're looking for a city,
Where you'd like to settle down,
Oh, we'll sing a little song as we travel
along

Of our dear old Toronto town.
Then they'd take another munch at—
turkey and break forth in some other
—key with

It looks to me like a big night to-night.
Big night to-night, big night to-night;
For when the old cat's away, why the
mice want to play,

And it looks like a big night to-night,
and it was some big night, no doubt.

After the inner man had been well catered to, the entertainers got right down to business. Will White made a good "Rooster" crowing as he did over the piano at our friend Brazil, and the turns he gave were a great credit to him. He simply kept the boys screaming with laughter.

Brazil came along with a family secret about some adventure he experienced one night, when on a visit to Jack Fullerton's home and if what was heard about Fullerton's Christmas cake is even moderately true, Jack and his family must have digestive organs which would shy at nothing between an anchor and a bunch of cast iron pipe fittings. We have neither space nor time to give the receipt in full, or even part. The sight of it would have scared any Jew junk dealer out of the locality.

Brother Clapperton brought along a splendid entertainer in his friend Parks. Mr. Parks simply kept the floor in an uproar, and everybody on it. He certainly added to the evening's enjoyment in no small way.

Then Ferguson came along with his



LeGrow's band, one of the sights on Canadian Night after a hard day at the convention.

friend MacDonald. He too told tales out of school when recalling some of the "nights out" he had spent with Ferguson. Ferguson got the blame o' gang-ing hame after haeing twa or three wee draps, and then creeping up the stairs in his bare feet, setting himself down and rocking the cradle fer aboot an hoor an a haw've, and then the wife waken-ing and seeing him, hoo lang he'd been rocking the empty cradle, as she hed the bairn in bed besides her. It's no fair to squeal on a pal in that way ye ken, Macdonal aye got the best o't, though the guests thought different, he was a corker of an entertainer ye ken, in fact Mae wasn't satisfied with bringing doon the hoose, but also assisted very much in bringing down an electric fan.

After that Vice-President Maxwell called upon Brother LeGrow for the event of the evening. Lewis has become very prominent in musical circles and introduced his marvelous talent for the first time. Those who heard this band were forced to admit that it was some

hand. What was more the instruments they used were so up to date that they had arrived before a name could be found for them. The names of those men who comprised the band have been withheld because of the fact that they will be required for the next annual convention, and would not be able to fill all the engagements demanded from them before that event, but they were some band.

The evening closed at 10 p.m. sharp with the usual vote of thanks from the delegates and guests present to the Toronto branch for the splendid night's entertainment.



The Standard Ideal Manufacturing Co., Port Hope, are issuing a beautiful catalogue referring to their new Victor one-piece bath, every sanitary engineer should possess one of these catalogues for reference. They may be procured by writing to the above company, Port Hope, Ontario.

A Plea That Some Authority Be Over Heating Installations

Commenting Upon the Slipshod Methods Adopted in the Installation of the Warm-Air Furnace, Which Has Resulted in Several Deaths in Toronto This and Every Winter.

By David Millar, Heating and Ventilating Engineer, Toronto.

There have been a number of efforts made to organize and promote the warm air furnace business. Furnacemen who are interested all seem agreed upon one point, and that is, that there requires to be something done to educate the people up to a point that a warm air system of heating is right if it is properly installed.

The foundation of the furnace business; all will no doubt agree, is the furnace of course, and the construction of the furnace is up to the manufacturer.

The public will never be convinced of the superior advantage of warm air furnace heating by manufacturers of publishing catalogues showing the superior points of their heater so long as they are installed in a slipshod manner, as they are, by inexperienced men who do not understand the theory of a practical installation—none but practical men should be allowed to install such furnaces, then it would take but little to convince the consumer of the superiority of the warm air furnace as heating system for the ordinary house.

There are a number of furnace manufacturers who do not understand the proper method of installation required. How then can they know the requirements of a properly constructed furnace? Too many furnace manufacturers are looking to their foundries to produce so many pounds of castings at so much per pound.

Most furnaces look alike to the average consumer, so that much depends upon the proper installation of same. We must recognize the fact and educate the public that scientific study and calculation are necessary for the proper installation of a warm air system as for the proper installation of any other system. As long as the furnace heating is a matter of competitive bidding, and the contract is awarded to the lowest bidder, no progress will be made in elevating the system of warm air heating from the low level at which it is at present, and no wonder that several lives have been lost as the result of defective furnaces or installations.

It is about time we had some bureau for the supervising of all heating installations. Inspection is given to plumbing, wiring, drains, etc., but when it comes to the furnace any old thing or method can

be used—the public is not protected against such work. The major portion of furnace work is done by builders who neither live in the houses where such work is done, nor seem to have much interest in obtaining a heating system which will give satisfaction to the tenants or purchaser. This character of work has been so unprofitable that many of the more experienced furnacemen have turned their attention to other fields. This has diverted the work to men who are not thoroughly acquainted with good practice of furnace installations, and accordingly have neither the interest in, nor the qualifications for the work they seem willing to do to suit the builder at his price.

Somehow it seems to be a matter of dollars and cents, rather than good health and common sense, and until there is some authority placed over our heating installations, there can be no hope of a cessation of the death-toll. The warm air furnace can be installed so as to give the most desirable results. It is not so costly as other systems, but should have just as great care taken in the method of installation as any steam or hot water heating. But because of the manual accomplishments required in the installing of the warm air furnace being so simple, every Tom, Dick or Harry who can use a pair of snips are allowed to install them with the results that every winter lives are lost.

PRACTICAL MAN FOR KINGSTON BOARD OF HEALTH.

A communication was received from the Plumber's Union, stating that a qualified plumbing inspector was needed in the city. The union thanked the Board for its interest in the ice matter, and pointed out that good plumbing was as essential to health as was pure ice. This opened up a general discussion in the course of which it was stated that the trouble with the city was that it loaded on one or two men so many and varied duties that they were unable to attend to any of them properly. The Board recommended to Council the appointment of a practical plumber as inspector.

Dr. Williamson reported the condition of a drain in the cellar of the store on the corner of King and Wellington streets. On his recommendation an iron pipe sewer will be laid.

KINGSTON HEALTH CAMPAIGN.

The board of health has asked the city council to appoint a permanent sanitary inspector, also a plumbing inspector. At present William McCammon, market clerk, acts as sanitary inspector, but the board demands that a man be appointed who will give all his time to the work.

THREATENS TO STOP CHATHAM FROM DUMPING SEWAGE INTO RIVER.

W. F. Smith, barrister, is threatening to issue an injunction to stop the city from dumping sewage from the city sewers into the river. It is said that complaints have been made by different people and the Provincial Board of Health has written the council, drawing attention to the fact that provincial regulations are being violated.

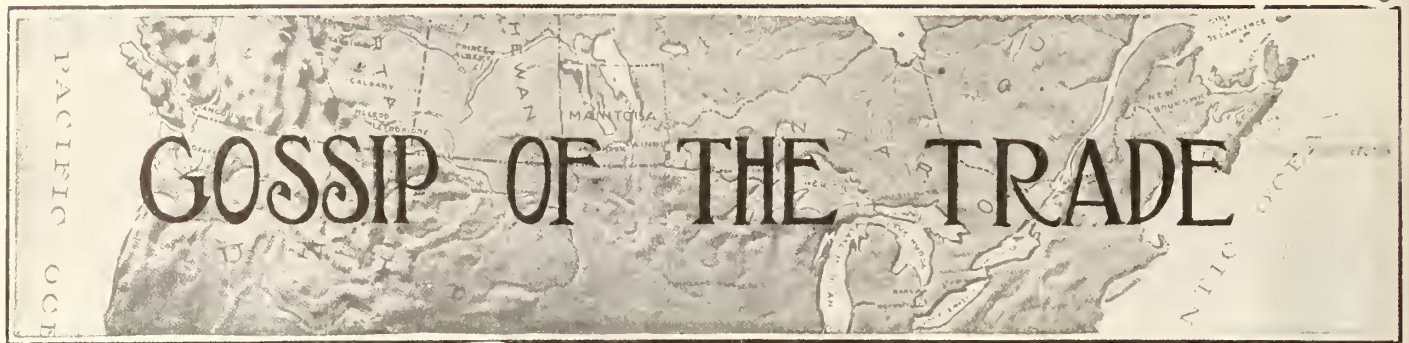
CHANGE OF ADDRESS.

Messrs. Bird & Weiler, plumbers and tinsmiths, Grimsby, Ont., have removed their place of business across to the north side of Main street into the single store in Society Hall.

They have put in a full line of bath room fixtures and their store makes a very well appearance, fitted up with all the latest in white enamel and nickel bathroom appurtenances.

NEW PARTNERSHIP.

A partnership has just been arranged between Mr. D. W. Gallagher, late of the firm of Gallagher & Walker, and Mr. G. Lythgoe, under the name of Gallagher & Lythgoe, and the firm will continue the business recently established by Mr. Lythgoe, undertaking every phase of the plumbing and heating business in Weyburn, Saskatchewan.



NEW COMPANY.

Family & Suttle, plumbers, have started business in Calgary.

NEW VENTURE.

The Capital Plumbing & Heating Co., Ltd., have started business in Regina.

CAPITALIZED.

F. W. Jeffrey & Sons, Ltd., Midland, Ont., capitalized at \$50,000, hardware, steamfitters, etc.

RETURNED HOME.

J. C. Stewart, of the Scott Heating & Plumbing Co., Weyburn, Sask., returned from Winnipeg early this week.

FIRE LOSSES.

Sanitary Supply Co., of Winnipeg, suffered a fire loss recently.

James White, sanitary engineer, Amherst, suffered a fire loss recently.

RETURNED HOME.

F. S. Lamson, manager of the Ash-down Hardware Co.'s heating and plumbing department, has returned from a business trip South.

ADDITION TO FACTORY.

A building permit was to-day issued to the Canada Metal Co. for the construction of a one-storey brick addition to their factory at Fraser avenue, near King, Toronto, to cost \$7,000.

CHANGE OF ADDRESS.

The firm of Frederick Dresh & Son, plumbers and tinsmiths, Windsor, who have occupied the premises at 17 Ferry street, will move to new quarters at 22 Pierre avenue.

TORONTO IS TO GIVE SOME ATTENTION TO HEATING AND VENTILATION.

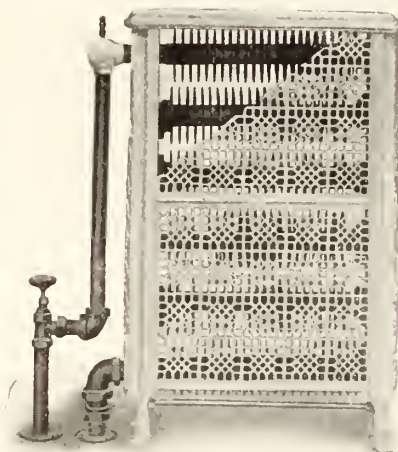
A thorough investigation of all the places in the city where there are workmen is being arranged by Dr. Hastings, M.O.H., to find out mainly whether the ventilation devices are adequate. Elaborate cards have been prepared which

will be filled out by the inspectors when on their rounds.

Some of the details called for are the number of rooms, the condition of the light and heating and ventilation, the humidity and temperature. Then the number of men, women and children employed, with the cubic feet of air space for each.

NEW RADIATOR.

The Vici Radiator Co., Hamilton, Ont., are issuing a very interesting booklet on their new radiator. They



make several very interesting claims for their goods. This little booklet should be read by each in the trade, and can be procured by writing to the above address.

NEW FIRM FOR GUELPH.

Guelph, Ont.—The Canadian Metal Products, Ltd., has purchased the buildings and machinery of the Standard Fitting & Valve Co. The new firm of which W. B. Henman, formerly of Cleveland, Ohio, is president, will manufacture high carbon steel structural tubing.

TRAINING SANITARY ENGINEERS

C. H. MacLeod, vice dean of the faculty of science at McGill University, said that though McGill is doing all it can to equip young men so that they will be most useful to their country and is taking up the problem of sanitary

engineering, government aid would be welcomed very cordially. At present there are no students studying the problem as an exclusive subject. — Press Dispatch.

NEW PIPE COMPOUND.

Messrs. John Hudson & Co., of London, England, are publishing a fine little book on a new compound for pipe joints. They make some very interesting claims for the goods, the name it bears is "Manganesite." Those who wish to know more about this compound will do well in writing for this little book to John Hudson & Co., 4 Victoria Warehouses, Mansell St., London, E., Eng.

NEW BOOKLET.

The Buckeye Pump & Manufacturing Co., of Columbus, Ohio, are issuing some very interesting booklets and folders, describing their water lift pump. They make some very novel claims for their goods, and sanitary engineers interested in such apparatus should write to Messrs. the Buckeye Pump & Manufacturing Co., 189, 191 and 193 West Broad street, Columbus, Ohio.

CEMENT ON THE FARM.

Messrs. Alfred Rogers, Ltd., King St. West, Toronto, are sending out a beautifully gotten up book entitled "Cement on the Farm." It is full of drawings and illustrations showing how to manipulate cement, the making of forms and mixing cement is taken up thoroughly.

All those who are interested in making water cisterns and tanks, and septic tanks should write to the above address and procure one of these useful books.

NEW CATALOGUE.

The Empire Manufacturing Co., Ltd., London, Ont., are now issuing their new catalogue on water closets. It is beautifully gotten up, and is only a modest description of their products. Every sanitary engineer should be the possessor of one of these catalogues and may, by dropping a post card to the above address.

Sanitary Conditions as Reported Throughout Ontario

The Following Are a List of Replies to the Questions Asked in a Circular Sent Out to Every Town and Village in the Province of Ontario.

Headquarters, LONDON.

MEDICAL HEALTH DISTRICT NO. ONE.

D.M.H.O.—Dr. D. B. Bentley, SARNIA. Counties Essex, Kent, Lambton, Elgin, Oxford.

No.	City, town, etc.	Population.	Place.	Resident.	Location.	Sewage, if any, where discharged.	Waterworks, if any; Source.	Plumbing Laws.	
								If Any.	If Inspect'd.
1	568	Ailsa Craig	W. D. Yelf	J-7	Storm, Sauble River.	No.	Open Wells.	No.	No.
2	2,102	Aylmer	F. Light	K-9	No, Septic Tank.	Yes.	Flowing Wells.	No.	No.
3	2,500	Amherstburg	Ryau	M-2	Yes, Detroit River.	Yes.	Detroit River.	Yes.	Yes.
4	10,770	Chatham	R. McG. Coyle	L-5	Yes, Thames River.	Yes.	Thames River.	No.	No.
5	709	Lucan	G. A. Stanley	J-7	No.	No.		No.	No.
6	2,652	Leamington	A. E. Law	M-4	No.	Yes.	Flowing Wells.	No.	No.
7	46,300	London	J. R. Haslett	K-8	Yes, Thames River.	Yes.	Wells and Springs.	No.	No.
8	1,112	Norwich	Haines	J-10	No.	Yes.	Well.	No.	No.
9	676	Rodney	C. Martin	L-7	No.	No.		No.	No.
10	9,947	Sarnia	A. Joss	K-5	Yes, St. Clair River.	Yes.	St. Clair River.	No.	No.
11	2,302	Sandwich	C. Montague	M-2	Yes, Detroit River.	Yes.	St. Clair Lake.	Yes.	Yes.
12	14,054	St. Thomas	C. I. Bull	K-8	Yes, Kettle Creek.	Yes.		No.	No.
13	3,438	Wallaceburg	W. E. Grainger	L-4	Yes, Sydenham River.	No.		No.	No.
14	9,320	Woodstock	Davison	J-9	Yes, Septic Tank.	Yes.	Springs.	No.	No.

Headquarters, PALMERSTON.

MEDICAL HEALTH DISTRICT NO. TWO.

D.M.H.O.—Dr. T. J. McNally, OWEN SOUND. Counties Huron, Bruce, Perth, Grey, Waterloo, Wellington, Wentworth.

No.	City, town, etc.	Population.	Place.	Resident.	Location.	Sewage, if any, where discharged.	Waterworks, if any; Source.	Plumbing Laws.	
								If Any.	If Inspect'd.
1	550	Atwood	W. Price	H-9	No. Disposal Plant.	No.		No.	No.
2	15,196	Berlin	J. Hainsworth	I-10	Yes.	Yes.	Artesian Wells.	Yes.	Yes.
3	902	Brussels	Walker	H-8	No. Septic Tank.	No.		No.	No.
4	1,782	Elmira	F. Rudow	L-11	No. Septic Tank.	Yes.	Flowing Wells.	Yes.	Yes.
5	511	Erin	Jos. Hiltz	H-11	No.	No.	Springs and Wells.	No.	No.
6	1,555	Exeter	W. J. Heaman	L-7	No. Septic Tank sew. bed	Yes.	River Sauble.	No.	No.
7	15,175	Guelph	F. Smith	I-12	Yes. Speed River.	Yes.	Springs 8 miles.	Yes.	Yes.
8	792	Hensall	J. H. McDonell	I-7	No.	No.	Wells.	No.	No.
9	2,289	Listowel	S. L. Adolph	H-9	No. Septic Tank.	Yes.	Wells.	No.	No.
10	2,811	Meaford	D. B. Brown	F-10	Yes. Big Head River.	Yes.	Georgian Bay.	No.	No.
11	2,143	Millbrook	J. Ritter	I-9	No.	No.		No.	No.
12	1,839	Mt. Forest	Ed. C. Thornhill	G-10	No. Septic Tank.	Yes.	Artesian Well.	No.	No.
13	1,484	New Hamburg	J. R. Feitch	I-10	No.	No.		No.	No.
14	12,558	Owen Sound	Insp. Chas. J. Pratt	F-9	Yes. Sydenham River.	Yes.	Springs & Filtered.	Yes.	Yes.
15	1,235	Port Elgin	Jas. H. Kennedy	F-8	No. Septic Tank.	Yes.	Spring.	No.	No.
16	3,883	Preston	W. A. Spalding	I-10	Yes. Grand River.	Yes.	Spring.	Yes.	Yes.
17	576	Ripley	D. Nunn	G-7	No.	No.	Wells.	No.	No.
18	12,946	Stratford	Dan MacDermid	I-8	Yes. Disposal Plant.	Yes.	River & Art's'n Wells.	Yes.	Yes.
19	4,359	Waterloo	M. Weichel	I-10	Yes. Severn River.	Yes.	Flowing Wells.	Yes.	Yes.
20	2,266	Warton	J. Flett	E-8	Yes. Coppings Bay.	Yes.	Coppings Bay.	No.	No.
21	2,238	Wingham	W. J. Boyce	H-7	Yes. Septic Tank.	Yes.	Artesian Well.	Yes.	Yes.

Headquarters, HAMILTON.

MEDICAL HEALTH DISTRICT NO. THREE.

D.M.H.O.—Dr. R. A. McClanahan, WATERDOWN.

Counties of Norfolk, Brant, Haldimand, Welland, Lincoln, Wentworth, Halton, Peel, York.

No.	City, town, etc.	Population.	Place.	Resident.	Location.	Sewage, if any, where discharged.	Waterworks, if any; Source.	Plumbing Laws.	
								If Any.	If Inspect'd.
1	1,901	Aurora	Wm. Ough	G-13	No.	Yes.	Artesian Wells.	No.	No.
2	23,132	Brantford	W. Allen Tipper	J-11	Yes, Grand River.	Yes.	Filtered Grand River.	Yes.	Yes.
3	952	Caledonia	C. H. Marshall	J-12	Yes, part, Grand River.	Yes.	Grand River	No.	No.
4	736	Cayuga	Wm. Murray	K-12	No, Grand River.	No.		No.	No.
5	4,299	Dundas	Louis Gies	J-12	No.	Yes.	Spring Creek	No.	No.
6	1,146	Fort Erie	W. K. Lighthart	K-15	No.	Yes.	Lake Erie.	No.	No.
7	1,583	Georgetown	J. Kennedy	H-12	No.	Yes.	Silver Creek.	No.	No.
8	81,969	Hamilton	W. C. Brittain	J-12	Yes, Burlington Bay.	Yes.	Lake Ontario.	Yes.	Yes.
9	1,106	Hagersville	F. E. Sheldrick	K-11	No.	No.		No.	No.
10	510	Jarvis	E. Carter	K-11	No.	No.		No.	No.
11	2,996	Newmarket	G. A. Binns	G-13	No. Cess Pool.	Yes.	Artesian Wells.	No.	No.
12	9,248	Niagara Falls	M. Cole	J-14	Yes, Niagara River.	Yes.	Niagara River.	Yes.	Yes.
13	2,372	Oakville	T. Slean	I-12	Yes, Disposal tk., L. Ontario	Yes.	Lake Ontario.	Yes.	Yes.
14	12,484	St. Catharines	H. A. Bold	J-14	Yes, Welland Canal.	Yes.	Lake Erie.	No.	No.
15	395,407	Toronto	Thos. Ferguson	I-13	Yes, Lake Ontario.	Yes.	Lake Ontario.	Yes.	Yes.
16	5,318	Welland	E. Cardwell	K-14	Yes, Welland River.	Yes.	Welland Canal.	No.	No.
17	1,875	Weston	F. Sainsbury	H-13	Yes, Humber River.	Yes.	Humber River.	Yes.	Yes.

Headquarters, PETERBOROUGH.

MEDICAL HEALTH DISTRICT NO. FOUR.

D.M.H.O.—Dr. G. Clinton, BELLEVILLE.

Counties Muskoka, Simcoe, Ontario, Victoria, Durham, Northumberland, Hastings, Prince Edward, Peterboro.

No.	City, town, etc.	Population.	Place.	Resident.	Location.	Sewage, if any, where discharged.	Waterworks, if any; Source.	Plumbing Laws.	
								If Any.	If Inspect'd.
1	2,776	Bracebridge	A. S. Bates	D-14	No.	Yes.	Springs.	No.	No.
2	2,814	Bowmanville	W. H. Dustan	H-15	Yes. Disposal Plant.	Yes.	Springs.	No.	No.
3	1,320	Brighton	C. C. Harris	H-18	No.	Yes.	Springs.	No.	No.
4	3,051	Campbellford	D. S. Arthur	G-18	No.	Yes.	Trout River.	No.	No.
5	5,074	Cobourg	A. R. Dundas	H-17	Yes, Lake Ontario.	Yes.	Lake Ontario.	No.	No.
6	7,090	Collingwood	J. A. Caslake	F-11	Yes, part, Septic Tank.	Yes.	Georgian Bay.	Yes.	Yes.
7	643	Creemore	W. A. May	F-11	No.	Yes.	Springs.	No.	No.
8	1,053	Penelon Falls	F. Kelly	F-15	No.	Yes.	Springs.	No.	No.
9	2,358	Huntsville	J. E. Mostey	D-14	Yes, Muskoka River.	Yes.	Hunter's Bay.	No.	No.
10	6,964	Lindsay	M. Boxall	F-15	Yes, Scugog River.	Yes.	Scugog River.	Yes.	Yes.
11	4,663	Midland	I. J. Campbell	E-12	Yes, Georgian Bay.	Yes.	Springs.	Yes.	Yes.
12	3,568	Penetang'hene	G. N. Wright	E-12	Yes, Georgian Bay.	Yes.	Artesian Wells.	No.	No.
13	18,300	Peterboro	R. G. Sturgeon	G-16	Yes, Otonabee River.	Yes.	Otonabee River.	Yes.	Yes.
14	3,564	Pictou	M. Adams	H-20	No.	Yes.	Bay of Quinte River.	No.	No.
15	5,092	Port Hope	G. W. Millward	H-17	Yes, Lake Ontario.	Yes.	Lake Ontario.	No.	No.
16	1,148	Port Perry	W. L. Parrish	G-15	No.	Yes.	Lake Scugog.	No.	No.
17	3,988	Trenton	S. B. McClung	G-19	Yes, Septic Tank.	Yes.	Springs.	No.	No.
18	1,433	Uxbridge	H. Shelley	G-14	No.	Yes.	Springs.	No.	No.

(Continued on next page.)

"Shop Economics"—A Talk With Boss, Journeyman and Helper

Showing Where Savings Could be Made, Where the Boss Would Save, Journeyman Earn, and Helper Learn, by Adopting the Right Method at the Right Time.

ONE of the best assets a sanitary and heating engineer can have is a number of customers with whom he is on friendly terms. We hear some of our readers say: "That's true; but how can we acquire that friendly asset?" Well, here are one or two ways. In the first place, take an interest in your customers from more than a monetary standpoint. Make it a point to save the customer all you can, and take a little more personal interest in him and his troubles. For instance, the writer was in a house the other day that had been closed up for three or four months and just recently re-rented. There had been no fire in the house during the cold weather which has been experienced recently, with the result that the w.c. bowl was cracked and the trap under the bath was split with having been frozen solid.

The owner told the writer that a plumber had been called in to attend to things, so that they would not freeze, and this is what has happened: The water had been turned off; the trap at the sink had been drained out and left open, and the taps had all been opened. Now can we wonder at the public getting sore at the craft? It seems too bad that such things should happen in these days of enlightenment, and we venture to assert that a plumber who knows no better, or is careless to such an extent as to actually fail to use common sense on such a simple job is not fit to be allowed to practice in the trade.

Just imagine for one moment a man leaving a trap screw out and the seal broken, thus allowing the sewer gas to enter the house, or leaving water in the trap of the w.c. bowl and bath. This man had, we suppose, a \$1 license from the city, minus brains. This is a question which should be on all examination papers, and should be answered properly. It is a simple matter, but it is also a very serious matter. If the man had taken care to blow the trap of the bath or poured down about a pint of coal oil, thus flushing the water out and sealing the trap with the coal oil, also doing the same with every fixture (the w.c. bowl, of course, would require more than a pint), all would have been well. He should then have told his client not to turn the water on until the house had been thoroughly heated up, so as to prevent the cold pipes from freezing the water before it had got through the system. This has happened many a time, and is easily overcome in a house where the furnace is a hot air furnace. In a house where the hot water system or steam is used the problem is a little more difficult, though still very simple.

First, a good handful of salt should be dissolved in a few pails full of hot water. Pour this into the expansion tank and follow up with, say, a few more pails of warm water, then light a slow fire of wood, and get another few pails of water into the furnace so as not to damage it. See that all the air valves are

opened, and when the frost has been taken out of the house, turn on the water supply. Such a course would make more friends than anyone would believe. There are thousands of dollars' worth of work which could be done that is left undone because of the distrust which prevails towards the sanitary and heating engineer. The writer is of the firm belief that this feeling can only be wiped out by allowing none but practical and thoroughly qualified men to install such work as sanitary and heating engineering, and the more our craft strives together with that aim in view the sooner will they get the support of the public at large to assist them. The public are paying thousands of dollars for work which is not worth half the amount, and at the same time are neglecting to have work done which should be attended to. The heating problem is one which is in sore need of thorough inspection by qualified men. Every week during the winter months we hear of either loss of lives or very narrow escapes as a result of either defective furnaces or smoke pipes being in bad repair, all of which should be looked into. Hence we hope to see our craft take steps to bring better laws into force which will require both heating and ventilation to come under some authoritative board, and be inspected before people are allowed to take up residence in such buildings.

MEDICAL HEALTH DISTRICT NO. FIVE.

Headquarters, KINGSTON.

D.M.H.O.—Dr. P. J. Maloney, CORNWALL.

Counties Renfrew, Addington, Frontenac, Lanark, Leeds, Carleton, Grenville, Dundas, Stormont, Glengarry, Russell, Prescott.

City, town, etc. No. Population.	Place.	Resident.	Location.	Sewage, if any, where discharged.	Waterworks, if any; Source.	Plumbing Laws.	
						If Any.	If Inspect'd.
1	9,374	Brockville	Geo. Ross	P-25	Yes, St. Lawrence River.	Yes.	Yes.
2	6,598	Cornwall	J. G. Hunter	D-27	Yes, St. Lawrence River.	Yes.	No.
3	1,189	Eganville	J. Fleury	C-20	No.	No.	No.
4	3,804	Gananoque	W. F. Martin	G-23	Yes, St. Lawrence River.	Yes.	Yes.
5	849	Iroquois	S. Landon	E-25	Yes, St. Lawrence River.	Yes.	No.
6	2,870	Napanee	M. Boyle	G-21	Yes, Napanee River.	Yes.	No.
7	3,588	Perth	W. G. Butler	E-23	Yes, River Tay.	Yes.	Yes.
8	2,501	Prescott	Chas. Baker	E-25	Yes, St. Lawrence River.	Yes.	Yes.
9	3,846	Renfrew	J. Conley	C-21	Yes, Bonnechere River.	Yes.	Yes.
10	6,370	Smiths Falls	C. Williseraft	E-23	Yes, Rideau River.	Yes.	No.

MEDICAL HEALTH DISTRICT NO. SIX.

Headquarters Medical Health Officer, NORTH BAY.

Districts of Parry Sound, Nipissing, Temiskaming, Sudbury.

City, town, etc. No. Population.	Place.	Resident.	Location.	Sewage, if any, where discharged.	Waterworks, if any; Source.	Plumbing Laws.	
						If Any.	If Inspect'd.
1	1,524	Mattawa	J. Loughlin	A-15	No.	No.	No.
2	2,108	New Liskeard	Jas. Murphy	M-27	Yes, Septic Tank.	Yes.	Yes.
3	7,737	North Bay	J. Cherry	A-13	Yes, Lake Nipissing.	Yes.	Yes.

MEDICAL HEALTH DISTRICT NO. SEVEN.

Headquarters, FORT WILLIAM. D.M.H.O.—Dr. R. E. Wodehouse.

Districts of Manitoulin, Rainy River, Algoma, Kenora, Thunder Bay.

City, town, etc. No. Population.	Place.	Resident.	Location.	Sewage, if any, where discharged.	Waterworks, if any; Source.	Plumbing Laws.	
						If Any.	If Inspect'd.
1	2,558	Blind River	H. Draper	N-25	No.	No.	No.
2	1,611	Fort Francis	M. East	L-17	Yes, Rainy River.	Yes.	No.
3	10,984	S. Ste. Marie	E. H. Barnes	N-24	Yes, St. Marys River.	Yes.	Yes.
4	4,150	Sudbury	J. R. Wainwright	N-26	Yes, Disposal Plant.	Yes.	No.

Include Interest on Investment in Overhead

Many Owners of Their Buildings Do Not Make Provision for This in Expenses—Why It Should Be There—Example of Successful Manufacturer—An Incomplete Statement.

It looks as if this letter might eventually become interesting:—

Sanitary Engineer, Toronto, Ont.

Dear Sirs,—Don't know to whom to address this but expect it will fall into the right hands. Took over this business July 1, 1913, and doing about \$40,000 per year (at that rate). Have \$2,000 out on good accounts. My expenses are about \$85 per week; get very good prices but don't seem to be able to pay bills the way I should. Please give a little advice, for which I am willing to pay.

Was located at _____, before in a small store; did about \$14,000 a year and made money every day.

Thanking you in advance,
Very truly yours,

But the writer thereof must give me further details to work with. Certain zoological sharks are said to be able to rebuild an entire skeleton if they are given a single spinal vertebra; but I cannot do that, though I have been able to dig some interesting facts from very few figures and meagre details.

So I must ask this gentleman to tell me what he put into the business; what average amount of cash he has on hand; what he thinks he makes on an average in margin; and complete details of his expense account, including everything—such as his own drawing account, or allowance for household expenses, etc. Then I may be able to help him. There will be no charge for the service—it is a matter of mutual helpfulness. He will aid us as much as we can possibly help him.

* * *

Fixed Charges or Overhead.

Some months ago, quoting from a pamphlet issued by an iron and steel making concern, I enlarged on the sound business policy of charging our own business with interest on its capital investment. So many have questioned the propriety of doing that that I am going to quote again, since the reasoning in that pamphlet seems to me particularly convincing and conclusive. The case is taken of a man who borrows \$10,000 with which to go into business, because he has plenty of money but it is invest-

ed where he does not wish to disturb it.

He borrows at 6 per cent., therefore pays \$500 annual interest and (properly) charges that \$500 into expense, or "overhead." After five years he is enabled to pay off the debt and thereafter have \$10,000 paid-up capital invested in the business. So I quote:

"Five per cent. on \$10,000 was considered a proper overhead charge five years ago; why is it not proper now?"

"Five years ago the business was required to earn 5 per cent. in order to pay interest and (we will assume) 20 per cent. to pay on the principal. Then you based your selling price on cost of raw material, productive labor and overhead, which last included \$500 interest. Why should you to-day reduce your selling price and profit simply because you are furnishing the capital instead of your creditor?"

"Are you not just as much entitled to demand \$500 interest to-day from the business as your creditor was five years ago?"

All of which seems so conclusive to me that I cannot improve it. I have charged interest on my capital investment every year before I have figured any net profit at all.

Division of Expense.

What does it cost us to sell goods? The old, long-established English rule is that we shall pay from 6 per cent. to 7½ per cent.—never more than 7½ per cent.—for our wages; but I know of no rule for selling expense.

Recently I had occasion to figure what a certain clerk was costing me as a salesman. Dividing his salary by his sales over a period of five weeks I found that he was costing me 3¼ per cent.; but that man's time was not all taken up in selling. Probably not half the time could be so charged. This because he was window dresser, took care of the cracker department, buying all the supplies, and planned and executed a lot of the interior displays. I calculated that the actual selling time did not cost me more than 1¾ per cent. to 2 per cent.

To what account, then, should the remainder of his wages be charged? Plainly, to general expense, or overhead.

In the manufacturing business, work done by a man in turning raw material

into finished products is called "productive labor," and, as such, is charged into cost of the various jobs. Other work, such as a foreman superintending a job, goes into overhead. Probably a similar practice would be good in our business. We might properly analyze our expenses so that, as in the case of the clerk mentioned, actual selling time should be charged to wages and the remainder to overhead; because selling is productive and other work is certainly general in its character.

Items of Overhead.

The following is given as a list of overhead charges; and I think it will fit our business, as far as it goes, just as well as it fits the manufacturing business:

1. Stationery.
2. Postage.
3. Telegraph.
4. Telephone.
5. Insurance.
6. Advertising.
7. Fuel.
8. Light and Heat.
9. Traveling Expenses.
10. Taxes.
11. Power.
12. Rent.
13. Repairs.
14. Depreciation.
15. Salaries of employees not engaged in productive labor.
16. Claims allowed.
17. Bad debts.
18. Attorneys and collection fees.
19. Salaries of principals.
20. Interest on borrowed money.
21. Interest on investment.

One more quotation will probably give us enough to think of this week.

"19. An individual, a partner or officer of a corporation, should consider his services worth a fair salary, and not feel content with simply his share of the earnings of the business. Therefore, it is necessary and right that fair salaries for principals should be considered in overhead."

Examples for Guidance.

In looking around for guide posts to show us the right way, we should choose the sayings of those who have made a success of their undertakings. The concern from whose pamphlet I quote is conspicuously successful in a fiercely competitive field. So it seems to me that details drawn from its long experience should merit our closest attention. That is why I give these details the space I have here assigned to them.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

SIZE OF EXPANSION TANKS.

Editor Sanitary Engineer.—What is the usual size of the expansion tank used on a hot water system of heating, and is there any other kind of tanks used other than the one as per sketch?

An Inquirer.

Replying to "Inquirer," we may state there is the open tank used, as shown in Fig. 2, and it is fitted up with an automatic ball cock, such as is used on a w.c. tank, and is connected up as shown. Such a tank as shown and submitted by "Inquirer" requires watching so as to be sure the water does not get too low. —Editor.

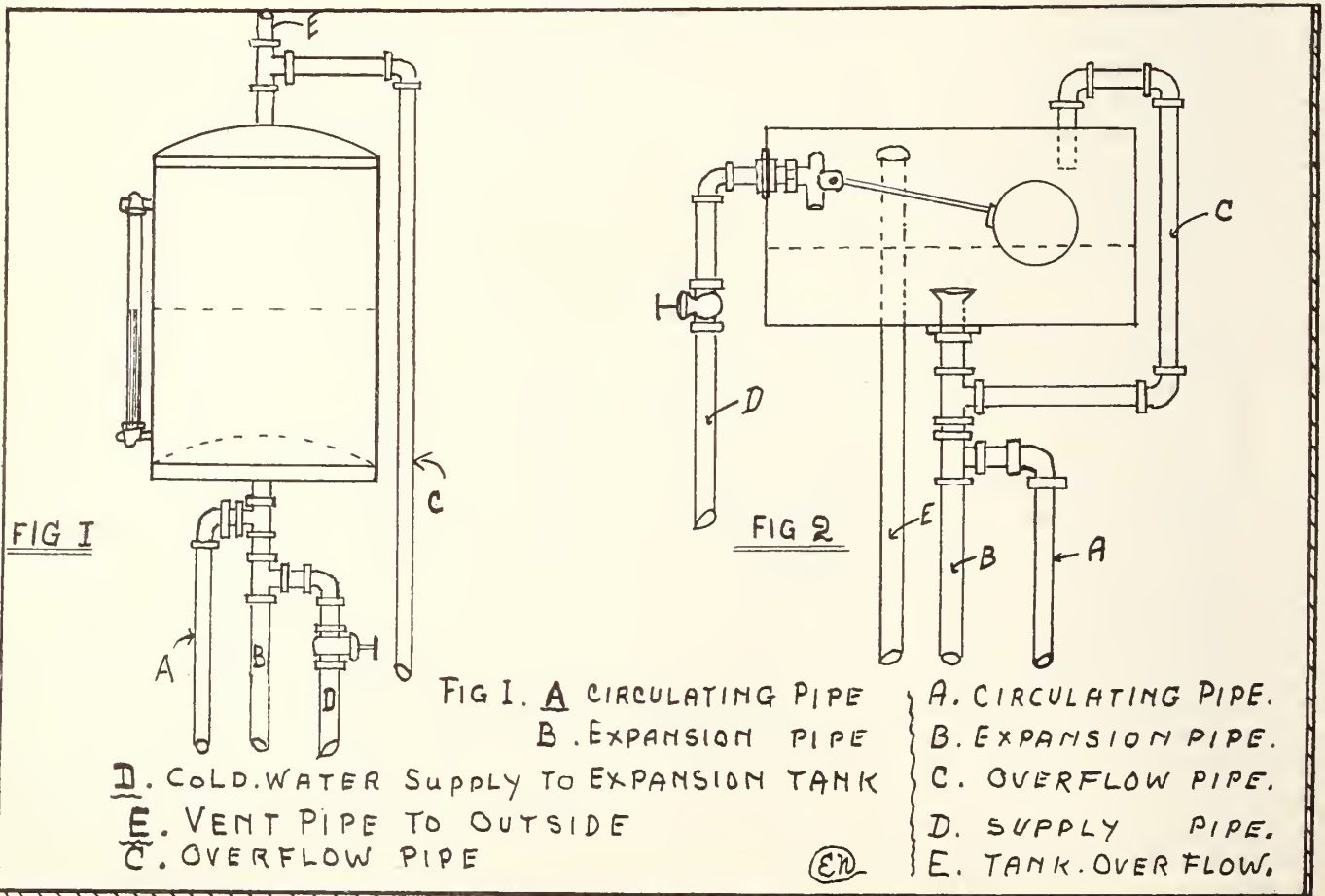
WHAT IS ALUMINUM SOLDER COMPOSED OF?

Editor Sanitary Engineer.—In your last issue of Sanitary Engineer you had a question in these columns regarding aluminum solder. Could you please furnish me with a good recipe to make aluminum solder, and how to use it.

A Subscriber.

In answer to our correspondent, "A Subscriber," we herewith give the list of necessary ingredients and quantities to make a good aluminum solder, 75.5 parts pure tin; 2.5 parts aluminum; and

18 parts zinc. The best method to make it would be by first melting each ingredient in a separate crucible, as they all melt at very much different heats, then add the zinc and tin together and stir, then pour in the aluminum and stir well. No flux is necessary for this solder, the article to be repaired is simply scraped clean, and the solder melted so as to drop on the article to be repaired. Then a clean piece of steel is rubbed on both the solder and article. A gasolene torch flame must be directed on the part to be repaired during the operation. —Editor.



WATCH THIS PAGE FOR NEW ARTICLES



"The Best"

NOT THE CHEAPEST

EMPIRE MANUFACTURING CO., LIMITED
LONDON, CANADA

MANUFACTURERS OF AND DEALERS IN
PLUMBERS' AND STEAMFITTERS' SUPPLIES OF ALL KINDS

Modern Physiology

PROF. ARTHUR BATEMAN.

Director of Anglo-American Sanitary Correspondence College, 10 and 12 Ontario St., Chicago.

A man who is 150 pounds in weight, contains sufficient ingredients in his body to equal 100 dozen eggs. There is iron enough in his system to make four ten penny nails. His body contains in a condensed form 36,954 cubic feet of gas, 25 candles, and a cake of soap. There is material enough to make heads for a sufficient number of matches to



Professor Arthur Bateman.

fill 8,064 boxes. Six teaspoonfuls of salt, a bowl of sugar, and 10 gallons of water are part of his 150 pounds. The hydrogen in his make-up would inflate a balloon big enough to lift him above the clouds.

When the fact is firmly grasped that every individual is 100 eggs, more or less, it is not hard to understand why some men are so easily broken up and so disastrously affected when they are beaten, and why others develop a yellow streak and turn out bad. We all have heard of persons who were addled, and of others who are hard-shelled. Also,

we have often run into a man who is 36,954 cubic feet of gas. A word or two shrewdly pointed will usually tap his tank and bring on a flow which can be shut off only with the greatest difficulty. Everybody knows the man who is as "sharp as tacks," and the man with an iron constitution or a steely eye. Every one gets a little rusty now and then. It may be that when a man is said to be crooked, it is because his ten penny nails have been trying to do the work of six penny nails and got twisted. We know what happens when a fellow gets "all lit up," it is his 25 candles that furnish the illumination. Besides we know why some persons are more brilliant than others. It is because their candles are in better commission. Some folks are touchy and flare up under friction. It's because there are so many match heads in them. It may be either the candles or the match heads that make them splutter. We all go up in the air once in a while. It is nothing but the hydrogen we contain. When the hydrogen gets beyond control we live in the clouds, a state of existence more unsatisfactory to those remaining on the ground than to those aloft. When the match heads are too often agitated or the candles lighted up too frequently there is danger that the hydrogen will be set off, in which case one goes all to pieces. There are some who will think that the estimate of sugar is too low, but that is a personal matter which may be adjusted to the mutual satisfaction of those concerned. Some of us water our personal stock too much, and that accounts for the great amount of vanity in the world.

spirator, fills himself full of lobster, pate de foie gras and tantalizing fluids and pays a check that would keep the entire Polinsky family in canned salmon for three weeks.

The food makes him mad after it begins to matriculate inside him, and indigestion grabs his vitals in both hands and wrings his internal mechanism until he yells for quarter. He calls his chauffeur, goes home in his \$12,000 touring car, finds his wife gone to a bridge game, and cusses accordingly. Miserable and lonely he sits down to unpleasant dreams!



Harry Gale Nye.

A bricklayer shuffling by the castle, with an empty dinner bucket in his hand and a gnawing in his stomach like a four-year-old rat eating a lath out of the ceiling at 2 o'clock in the morning, looks in at the windows and sighs.

"Ah, 'be rich," he muses "must be th' greatest t'ing in th' hull wur-rld!" And the rich man, affectionately stroking the button of his vest and feeling for his appendix, dodges another pain with a contortion wonderful to behold, and says:

"Oh, heavens! What is success?"

Success is happiness!

The man who is happy though he be poor or rich is successful.

We are too apt to make the mistake by looking for success through gold-rimmed eye-glasses. We expect to find success in a ravishing Worth gown, with jewels on her hands and with gems in her hair. Often we lose sight of the real ingenue—the shy lassie with the brown eyes, with the glow of health and beauty in her cheeks and the bunch of wild crab-apples at her throat, as we pass hurriedly by in our mad rush for the frou-frou and the glitter and the route of the imitation woman with the false curls and the walk like a kangaroo!

Take it from me: Money has nothing to do with success! Success is only a condition of mind—the condition that makes a man happy. Some of the most unhappy people in the world are the richest and some of the most disconsolate are the most famous.

What Is Success?

By HARRY GALE NYE

Being a Dissertation on What Nye Has Noticed In Passing

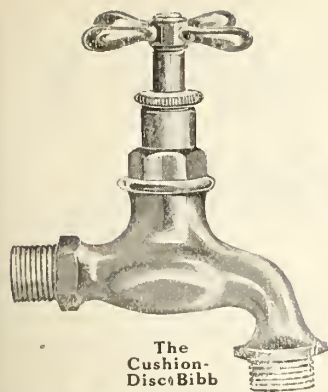
Theodore Roosevelt's idea of success is a drug store on the corner whose wide portals are always crowded by a maelstrom of newly-threatened fathers clamoring for the doctor.

The millionaire's idea of success is a castle wherein he may keep the biggest assortment of beautiful pictures, painted by artists whose names he cannot pronounce, and rare books, in editions de luxe, which he never reads! The millionaire couples wealth with a sense of power and a commiseration for the lowly, mellowed somewhat by a pain in

his stomach and a covetous longing for the appetites of the hoi polloi.

His commiseration, at times, takes the form of enlargement of the heart, as a direct result of which the Polinskies on Squalor street get a meal of canned salmon and pass the can on to the goat. Then the rich man goes down to his office and stirs up the distant relatives of the Polinskies and makes more in five minutes than he gives to charity in a year!

After having stormed the bastille, he goes out to luncheon with a fellow con-



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You can put Morrison Bibbs on any job and be sure of the result—a satisfied customer—at least in the matter of faucets. That's the assurance that goes with our J.M.T. trade-mark. Take a good look at that J.M.T. triangle—it's all you need to care about in buying bibbs, cocks and plumbing brass goods. We take care of everything else—design, quality, finish, service. And our prices are right, too.



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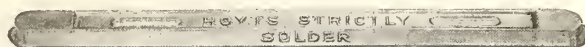
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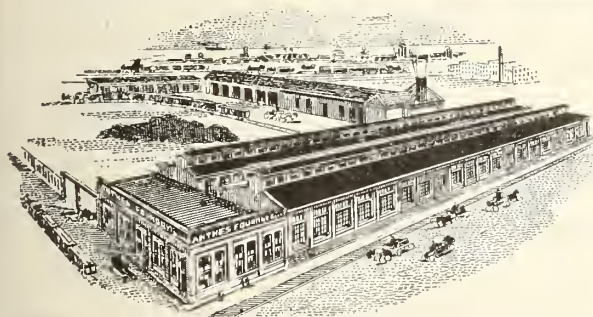
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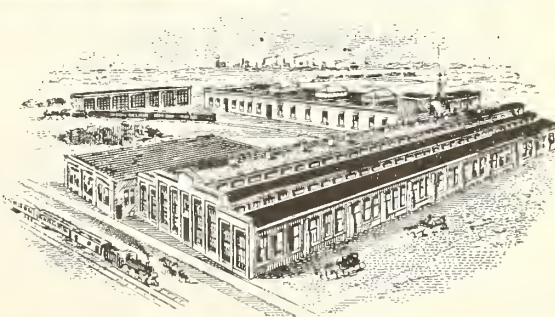
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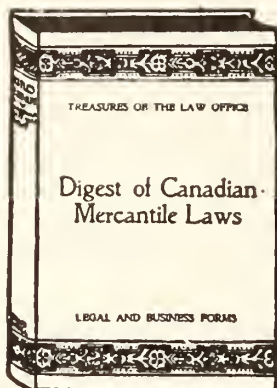


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Every Business Man Should Have a Copy of This Book in His Library

"Digest of the Mercantile Laws of Canada"

A READY REFERENCE FOR BUSINESS MEN AND THEIR ASSISTANCE. A GUIDE TO THEIR DAILY BUSINESS



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No work ever published in Canada equals it. A veritable consulting library on this one line so universally needed. Based on Dominion and Provincial Statutes and Court Decisions. Indorsed by barristers, sheriffs, magistrates and conveyancers. Below appears a few of the questions it answers. These are picked out at random from the book.

If you endorse a cheque which bank cashes, are you liable to the bank for the amount, if the cheque were forged or raised?—173.

(The figures after each question refer to the section in the "Digest" which gives the answer.)

Can interest written "one per cent. per month" in a note be collected by "legal process"?—See sections 345, 185.

In going security on a note, what is the difference between writing your name on the face of the paper or on the back?—171.

Why is it that a verbal agreement to buy real estate with, say \$100 paid down "to bind the bargain," does not bind either seller or buyer?—451.

If a proposition is made to you by letter and you accept it by letter, do you know the exact time when the contract is closed?—39.

How many years does it take a promissory note, a book account, a judgment or a legacy to outlaw in your province?—356, 359, 360, 367.

How long may the drawee legally hold a draft for acceptance?—209.

If a man, in the presence of witness, makes a verbal agreement to buy a wagon, say for \$53, but does not take possession of it, will the sale be binding?—500.

What effect has it on a will if only one person signs it as a witness?—815.

If the wife or husband of a legatee signs the will as a witness, what is the effect?—816.

"A," in paying off a Mortgage, gave mortgagee a marked cheque on which was written: "This cheque is given and received as a full settlement and discharge of Mortgage No.———" Is that a legal discharge?—410.

If a person goes with his hired man to a merchant and says: "Give this man the goods he may need up to," say "\$15, and if he does not pay you," say, "within thirty days, I will," will the promise bind him?—110.

If stolen goods are sold to an innocent purchaser for value, can they be taken from him?—513.

How may a person legally add "& Co." to his name, or use any special name other than his own as a firm name, without having a partner?—694.

"B" claims that the Canadian Bills of Ex. Act allows him two days, in addition to the day of presentment, to accept a sight draft, and then three days of grace in which to pay it—six days in all. Is he right?—209, 217.

If you rent a property for a year, the rent payable monthly, and remain on after the year expires, are you a yearly or a monthly tenant?—580, 608.

Can you garnishee a debtor's money deposited in a bank if you know it is there?—885, 295.

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Keep the book ten days, and if it is not worth the price, return it and get your money back. If remitting by cheque make same payable at par, Toronto. Eastern Edition, Price, \$2.00. Special Western Edition, \$2.50.

To meet the needs of subscribers in New Ontario and the Western Provinces, where land is under The Land Titles System of Registration, an Appendix of 16 pages, containing a synopsis of the Land Titles Acts, has been added to our regular edition, thus constituting a special "Western Edition." Price, \$2.50.

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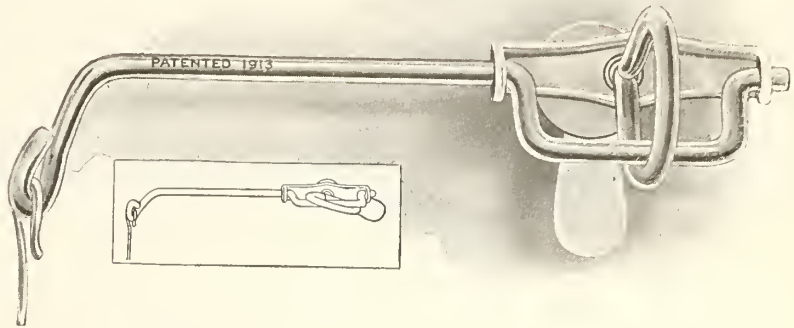
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Have your tank fitted with a

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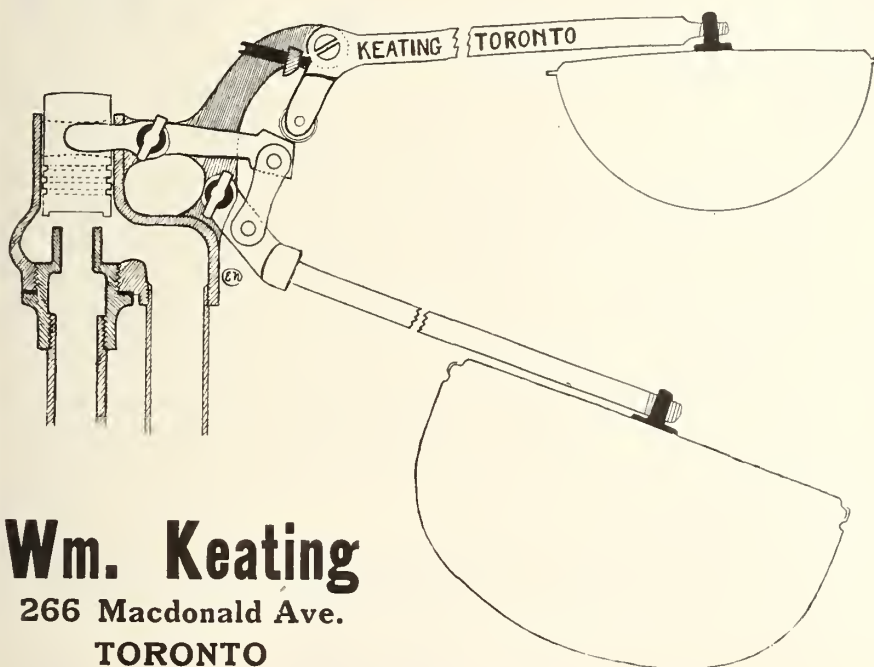
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It is a silent and quick filler; it is positive in its action; it will close off tight under any pressure; it is built for hard service; it is tested before leaving works and unconditionally guaranteed.

We have made Ball Cocks for over 30 years and our product shows it. Every Keating Ball Cock bears the name. Look for it.

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Write for full information.



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BLOCK TIN PIPE

The Canada Metal Co., Ltd.,

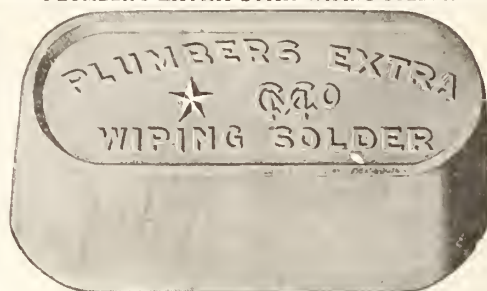
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THE SOLDER WITH THE TIN IN

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PULLS. He ought to know, and yet some men think that
advertising should go against all rules and precedents and
jerk them to success with one tremendous yank.

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Occasionally advertisements are inserted in the paper after the index has been printed. The inser-
tion of the Advertiser's name in this index is not part of the advertising order.

The index is inserted solely for the convenience of the readers of the paper.

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Nobody Knocks SYDENHAM Brass Cocks

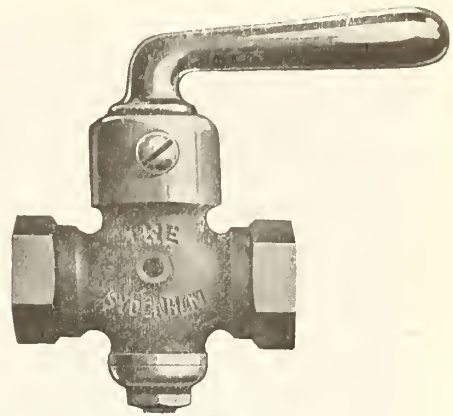
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Water-tight and easy-turning plugs are assured because the joints are perfectly ground.

Made for $\left\{ \begin{array}{l} \text{Double Iron} \\ \text{Lead and Iron} \\ \text{Double Lead} \end{array} \right\}$ pipe connections.

In all sizes, $\frac{1}{2}$ inch to 1 inch inclusive.

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Winnipeg,
Moncrieff & Endress, Ltd.,
Scott Bldg.

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J. R. Devereux,
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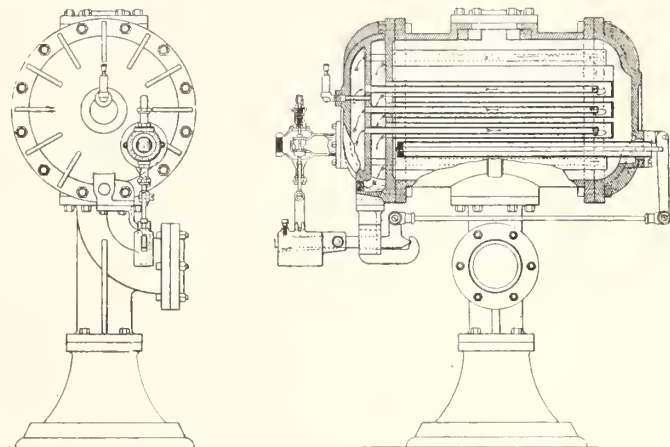
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THE MANNY HEATER

The Manny Heater is connected to a hot water system as the ordinary hot water furnace, and steam is carried to it from a boiler house stationed outside the main building, at regular boiler pressure, but reduced at every heater by a steam pressure reducing valve to 20-15-10-5 lbs., or as low as one pound to the square inch, according to temperature required in the building. The steam is carried to the Manny Heater from the boiler room through underground pipes.

There isn't a better or more economical way of heating large buildings. Many furnaces can be eliminated and much space saved. Supplied with or without Thermostats. Notice how provision is made for the expansion and contraction of tubes—Threaded Joints.

It means profit



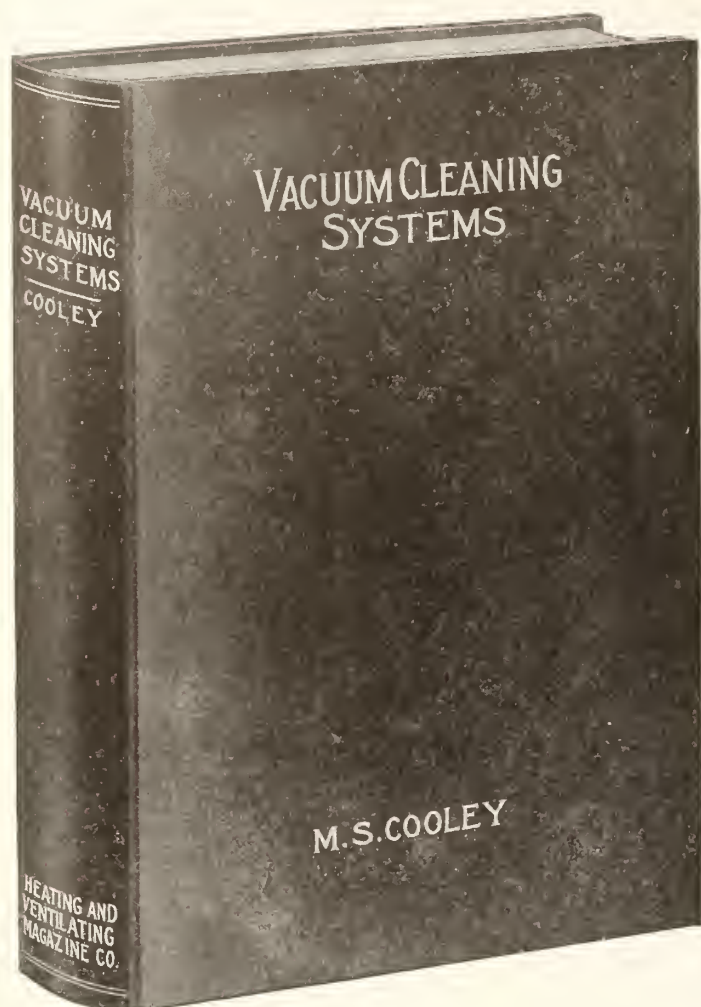
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*244 pages, 6 x 9 inches.
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The first full and authoritative treatise on the art of vacuum cleaning. Contains all of the author's important tests of vacuum cleaning apparatus, history of mechanical cleaning, requirements of an ideal vacuum cleaning system, together with chapters on the carpet renovator, other renovators, stems and handles, hose, pipe and fittings, separators, vacuum producers, control, scrubbing systems, selection of cleaning plant, tests, specification and portable vacuum cleaners.

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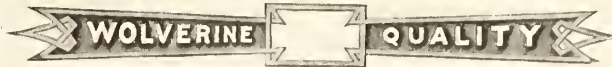
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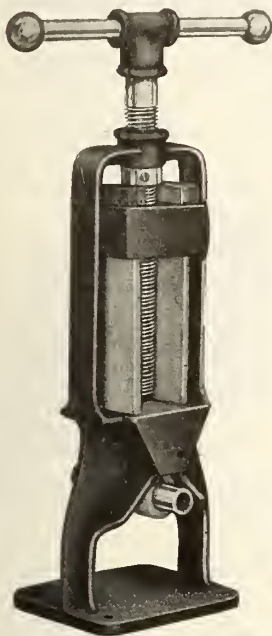
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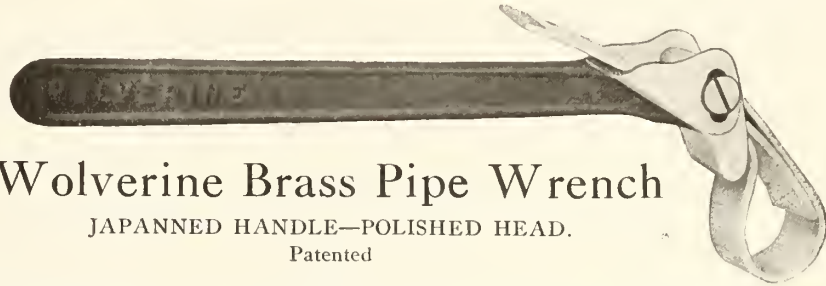


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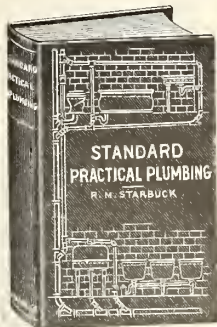
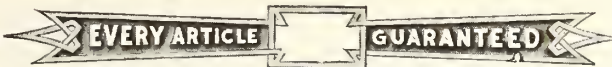
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Will not mar the finest surface. Strap is extra heavy and guaranteed to stand the strain and wear.

Wolverine Brass Pipe Wrench has a patent locking device which not only tightens with increased strain, but will instantly release strap when pressure is taken off. Will not mar or crush pipe.

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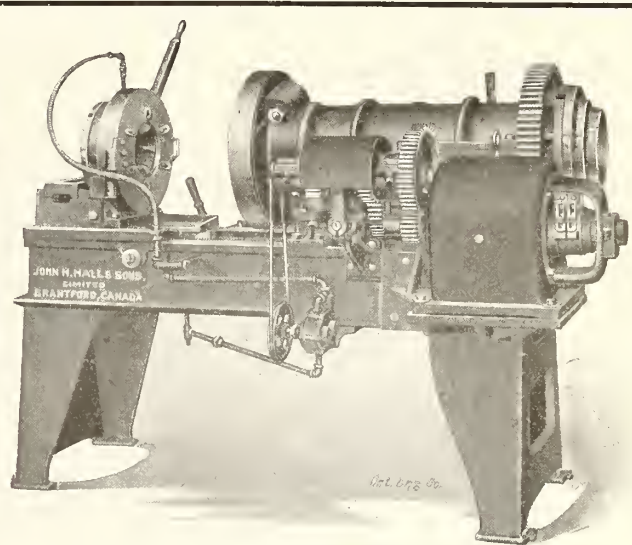
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Perfect threads
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These machines are Canadian-made and guaranteed in every way possible.

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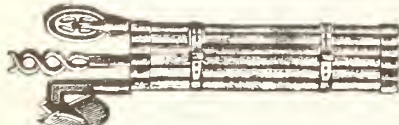
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FIRST-CLASS PLUMBING AND PUMP business in a town about 2,000, doing a good trade, water works just installed last summer and a good business is being done. An A1 business for a first-class plumber, stock about \$800.00. Good reasons for selling. Address Box 73, Fergus, Ont. (4tf)

CANADIAN PATENT FOR FLUSHING Valve for sale, cash or royalty. We believe more of our valves were used in Greater New York 1912-1913 than any six other makes combined. Address, Flushovalve Co., 536 Broome, New York. (5)

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Universal for Pipe and Fittings

A life may depend upon or an injury may result from the use of most tools. "AGRIPPA" Chain Pipe Wrenches are tested and proved dependable before they reach you. This practice is unknown elsewhere—every weakness is eliminated.

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Show us a plug which a Williams Waste Plug Spanner will not fit.

J.H. Williams & Co.

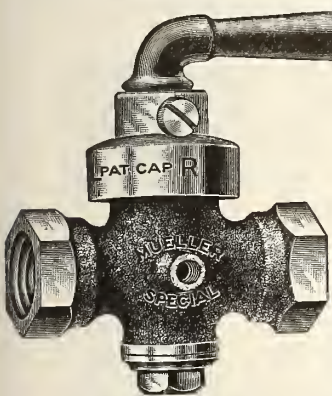
Superior Drop-forged Tools

77 Richards St., Brooklyn, N.Y. City
40 So. Clinton St., Chicago, Ill.

Classified Buyers Guide

Occasionally advertisements are inserted in the paper after the index has been printed. The insertion of the Advertiser's name in this index is not part of the advertising order. The index is inserted solely for the convenience of the reader of the paper.

- Asbestos Goods.**
Can. Johns-Manville Co., Toronto.
- Air Line Systems.**
C. A. Dunham & Co., Ltd., Toronto.
National Steam Specialty Co., Chicago.
- Aluminum Casting.**
Tallman Brass & Metal Co., Hamilton.
Canada Metal Co., Toronto.
- Brass Castings.**
Tallman Brass & Metal Co., Hamilton.
James Morrison Brass Mfg. Co., Toronto.
- Brass Goods, Valves, Etc.**
James Morrison Brass Mfg. Co., Toronto.
Wallaceburg Brass Mfg. Co., Wallaceburg, Ont.
Empire Brass Mfg. Co., London.
Dunham, C. A., Toronto.
- Brass Pipe and Tube.**
Empire Brass Mfg. Co., Toronto.
Tallman Brass & Metal Co., Hamilton.
Canada Metal Co., Toronto.
- Boilers, Steam or Hot Water.**
Warden, King, Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Pease Foundry Co., Ltd., Toronto.
- Burners.**
Standard Heating & Radiator Co., Pittsburgh, Pa.
- Correspondence Schools.**
Anglo-American Sanitary School.
- Country Residence Equipments.**
National Equipment Co., Toronto.
- Chicago Pump Co., Chicago.**
Leader Iron Works, Chicago.
- Closets.**
Empire Brass Mfg. Co., London.
James Morrison Brass Mfg. Co., Toronto.
Galt Brass Co., Galt.
Amherst Foundry Co., Amherst, N.S.
Johns-Manville Co., Toronto.
- Drainage Fittings.**
Fittings, Limited, Oshawa.
Warden, King, Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Empire Brass Mfg. Co., Ltd., London.
- Ejectors, Steam.**
James Morrison Brass Mfg. Co., Toronto.
Kerr Engine Co., Walkerville.
Tallman Brass & Metal Co., Hamilton.
- Ejectors for Sewage.**
Chicago Pump Co., Chicago.
Thomas & Smith, Chicago.
National Equipment Co., Toronto.
- Fittings.**
Fittings, Limited, Oshawa.
Steel & Radiation, Ltd., Toronto.
Warden, King, Ltd., Montreal.
James Morrison Brass Mfg. Co., Toronto.
Empire Brass Mfg. Co., London.
National Steam Specialty Co., Chicago.
- Generators.**
Honeywell Heating Specialty Co., Montreal.
James Morrison Brass Mfg. Co., Toronto.
National Steam Specialty Co., Chicago.
- Heaters.**
Steel & Radiation, Ltd., Toronto.
Warden, King, Ltd., Montreal.
Standard Heating & Radiator Co., Pittsburgh, Pa.
Pease Foundry Co., Ltd., Toronto.
- Lead.**
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Empire Brass Mfg. Co., London.
James Morrison Brass Mfg. Co., Toronto.
- Machinery Pipe Threading.**
Hall & Sons, Ltd., Brantford.
- Nipples.**
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Steel & Radiation, Ltd., Toronto.
Canada Metal Co., Ltd., Toronto.
Galt Brass Co., Galt.
Canadian Brass Co., Galt.
Empire Brass Mfg. Co., Ltd., London.
Wallaceburg Brass Mfg. Co., Wallaceburg.
Canadian Wolverine Co., Ltd., Chatham.
James Morrison Brass Mfg. Co., Toronto.
- Packing.**
Canadian Johns-Manville Co., Ltd., Toronto.
- Pipe, Black and Galvanized.**
Canadian Tube & Iron Co., Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Warden, King, Ltd., Montreal.
- Pipe Joint Compounds.**
National Steam Specialty Co., Chicago.
- Pipe, Soil, and Fittings.**
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- Radiator Fittings.**
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- Radiators.**
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- Steam Specialties.**
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Mouat-Squires Co., Cleveland.
Honeywell Heating Specialty Co., Montreal.
National Steam Specialty Co., Chicago.
Kerr Engine Co., Walkerville, Ont.
The E. S. Manny Co., Montreal.
Dart Union Co., Ltd., Toronto.
- Tools.**
Canadian Tap & Die Co., Ltd.
Borden-Canadian Co., Toronto.
Nye Die, Tool & Machine Co., Chicago.
Hall & Sons, Ltd., Brantford.
Armstrong Mfg. Co., Bridgeport, U.S.A.
Williams, J. H., & Co., Brooklyn, N.Y.
- Unions.**
Dart Union Co., Ltd., Toronto.
- Vacuum Systems of Heating.**
C. A. Dunham & Co., Ltd., Toronto.



You will be pleased and your customer will be satisfied with Mueller Ground Key Stop and Waste Cocks.

Recognized everywhere as the acme of perfection in ground key work. You will like to work with these cocks. Your customer will have no cause to complain of them.

If you have never used Mueller ground key cocks place an order now.

These cocks are made in stops and stop and wastes. They are tested under 200 pounds hydraulic pressure — and are Unconditionally Guaranteed. Made in Canada.

H. Mueller Mfg. Co.

SARNIA, ONT.

New York

Decatur, Ill.

San Francisco

S.E.
H.
MUELLER
MFG. CO.

Give full information and prices.

Signed

City

Province

It's not only a matter of Pride—

although that has a great deal to do with it. But leaving pride in your work out of the question for a moment—that you cut pipe off in the neatest, quickest, most direct way, is a matter of Efficiency.

And that is why you should relegate your old-fashioned, wheeled pipe-cutting contraption to the scrap-heap.

That is why you should put it behind you, and with it, split pipe, burred ends and a lot of trouble making dies start.

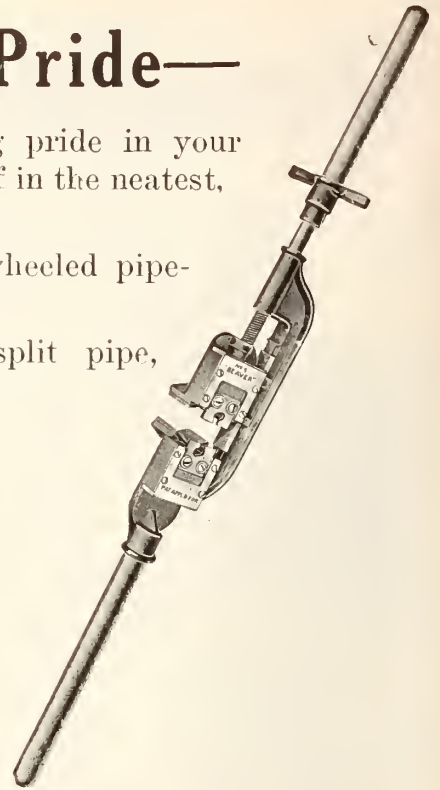
That is why you should get a

Beaver Square End Cutter

—the real pipe cutter—that cuts pipe off dead square, without splitting, and so free from burrs that it needs no filing or reaming whatever.

By doing that you'll be taking steps towards greater Efficiency, and that means towards more results for less work—more pay for less exertion. How does it sound to you, fellows?

Drop in on your dealer one night this week, and cut some pipe with the **Beaver**. Maybe you'll see it as strong as we do then!



BORDEN-CANADIAN COMPANY, Toronto, Ontario

WROUGHT PIPE



Prices Right

Prompt Service

Page-Hersey Iron, Tube & Lead Co., Ltd.

Head Office: 813 Traders Bank Building, Toronto, Ont.

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

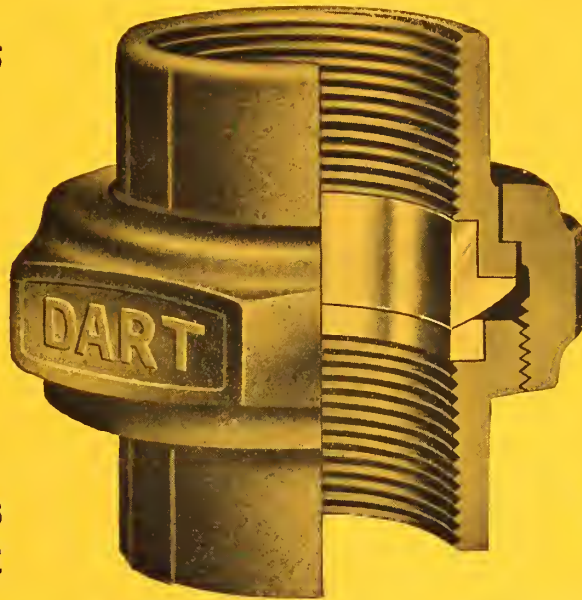
BRONZE TO BRONZE AT THE JOINT CANNOT RUST OR CORRODE

"Dart" Unions

save you time, because they can be easily and quickly connected, whether pipes are in or out of line.

They make pleased customers because they never leak or need repair.

**Sold by jobbers
from coast to coast**



Guarantee

All "Dart" Unions have the trade-mark as shown on the illustration. We promptly replace any Dart Union that is defective, 2 for 1.

**Dart Union Co., Ltd.
Toronto, Canada**



This is The Radiator Valve You Have Been Waiting For

An absolutely PACKLESS valve, with no composition rubber rings or discs in the bonnet to take the place of packing.

An all metal valve with accurately ground cone joint in bonnet, which will not score, cut or become unevenly worn, as the spindle bearing runs the length of the bonnet spindle cavity.

No strain on the stem or stem seat at any time other than the tension of the phosphor non-corrodible spring which holds it in its place.

All the thrust is against the threads on the disc carrier and in the heavy bonnet. The stem simply acts as a KEY to revolve the disc carrier. No inexperienced person can tamper with the working parts of this valve, as they are all

securely locked inside the valve.

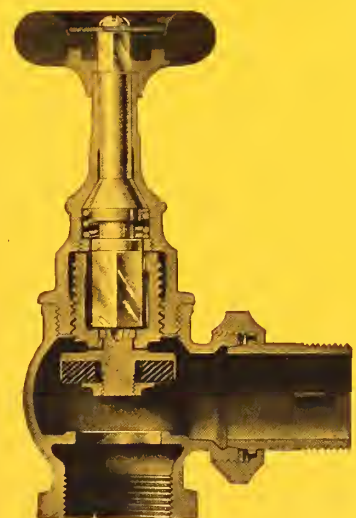
Every valve tested with steam, and we guarantee them to be tight.

Give this valve a trial on the next vacuum job or high class steam heating plant.

The Kerr Engine Company, Limited,
Valve Manufacturers,

WALKERVILLE,

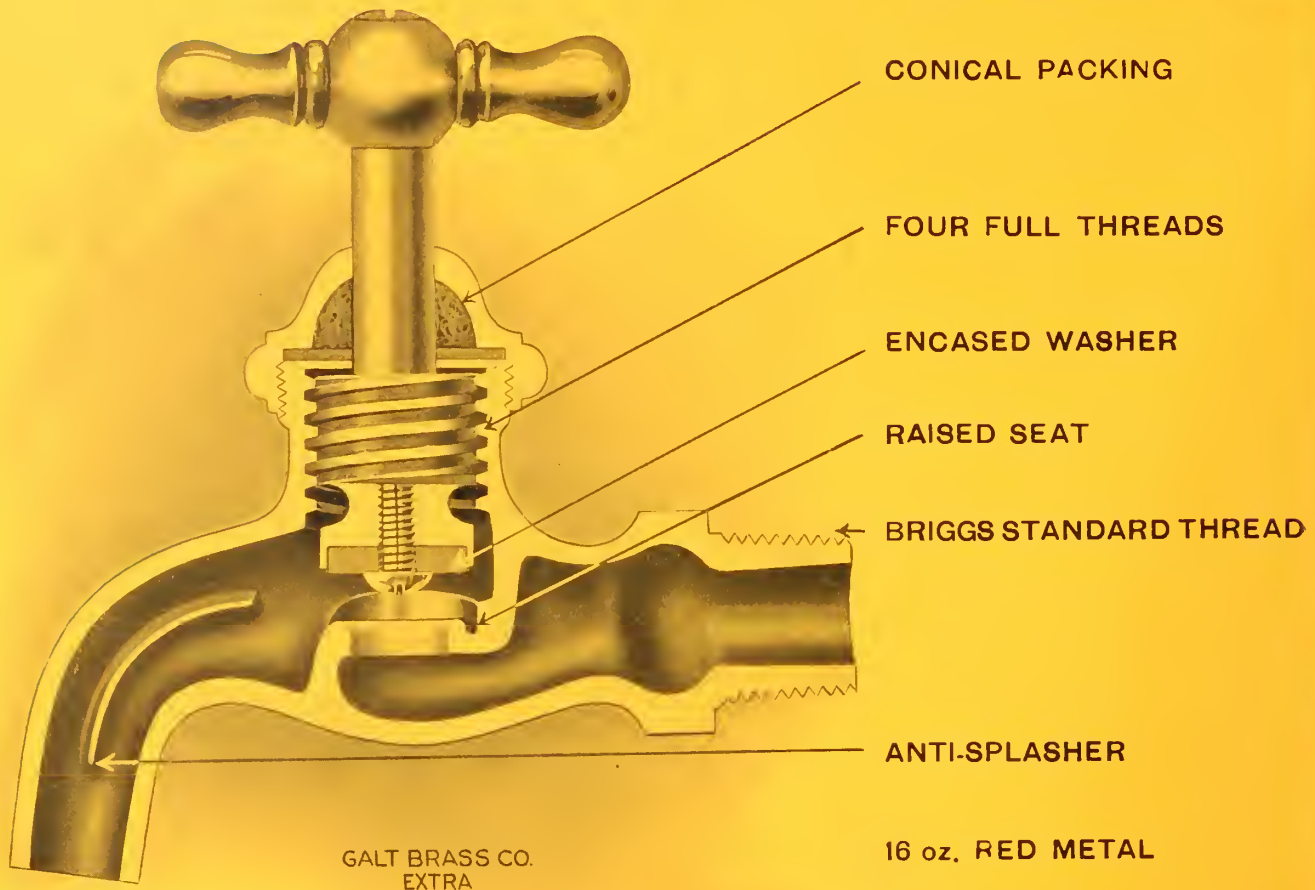
ONTARIO



THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

"RAPIDO"

(RAPID OPENING)



The above illustration shows, in actual size, the exact construction of all our Bibbs.

The same features are also embodied in all our Bath, Basin and Sink Cocks.

TESTED AND
GUARANTEED

Any article of our make proving defective through inferior metal, or improper workmanship, on our part, will be replaced with TWO good ones, at NO CHARGE to you.

TRADE MARK
GALT BRASS

GALT BRASS CO., Limited
GALT, CANADA

THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

Publication Office : TORONTO, APRIL 15, 1914

No. 8

ENAMELED
ALL-OVER

Victor BATH
ONE-PIECE

ENAMELED
INSIDE



The principle of the Victor Bath is a tub body cast integral with a Base and Wing Plates; the latter in various positions on the Tub Body to make the various Combinations, viz.:



Open Type
Corner Type
Recess Type
End to Wall Type
Back to Wall Type
Also with Extension
Rim at End or Back
for fittings—thru Rim

Catalogue and Prices on Request.

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

TORONTO
119 King St. East

MONTREAL
42-44 Beaver Hall Hill

WINNIPEG
76-82 Lombard St.

VANCOUVER
410 Carter Cotton Bldg.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

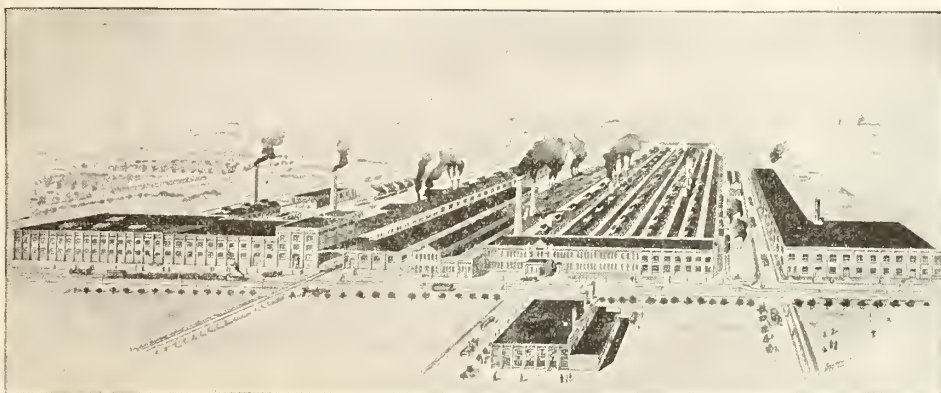
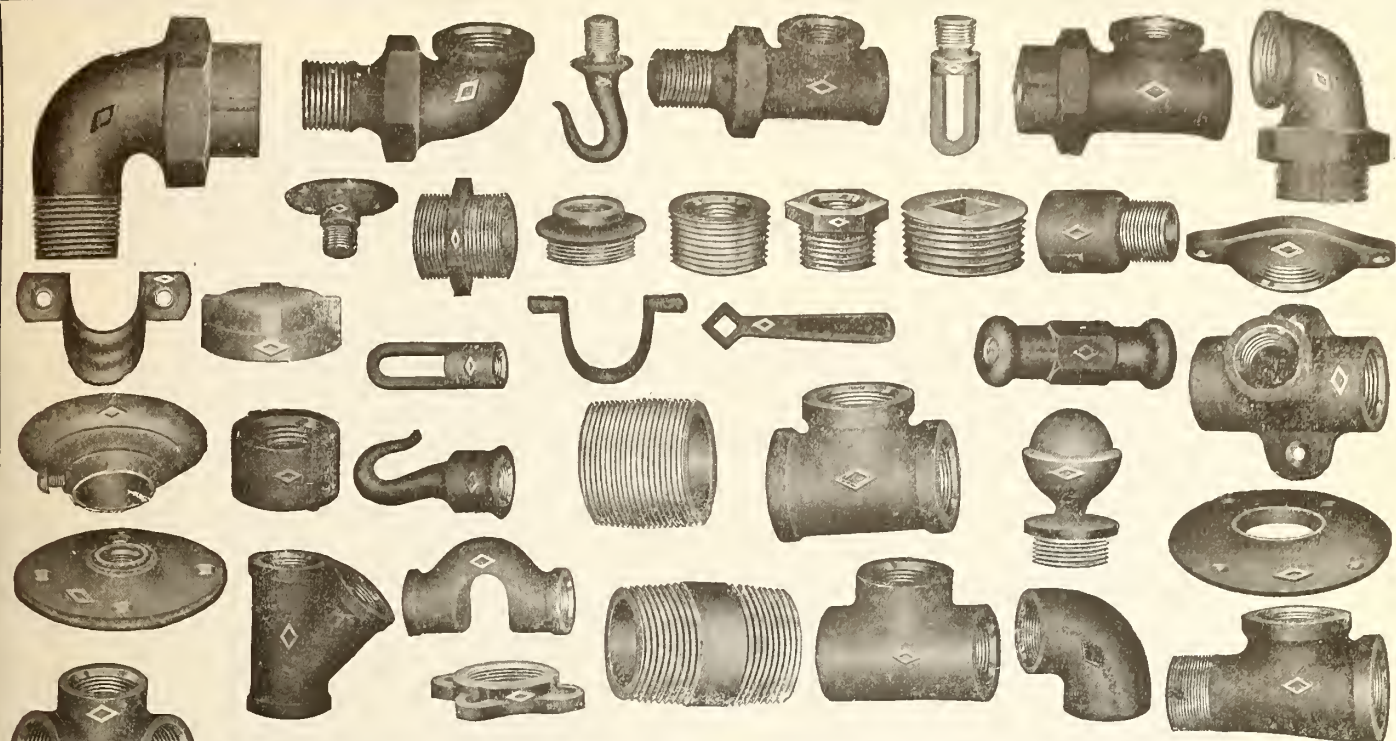
General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co.,
178 Victoria St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes,
120 Lombard St., Winnipeg

BRITISH COLUMBIA:
A. O. Campbell,
864 Cambie St., Vancouver



GENERAL OFFICES AND WORKS:

FITTINGS LIMITED, OSHAWA, CANADA

WAREHOUSES:

MONTREAL

WINNIPEG

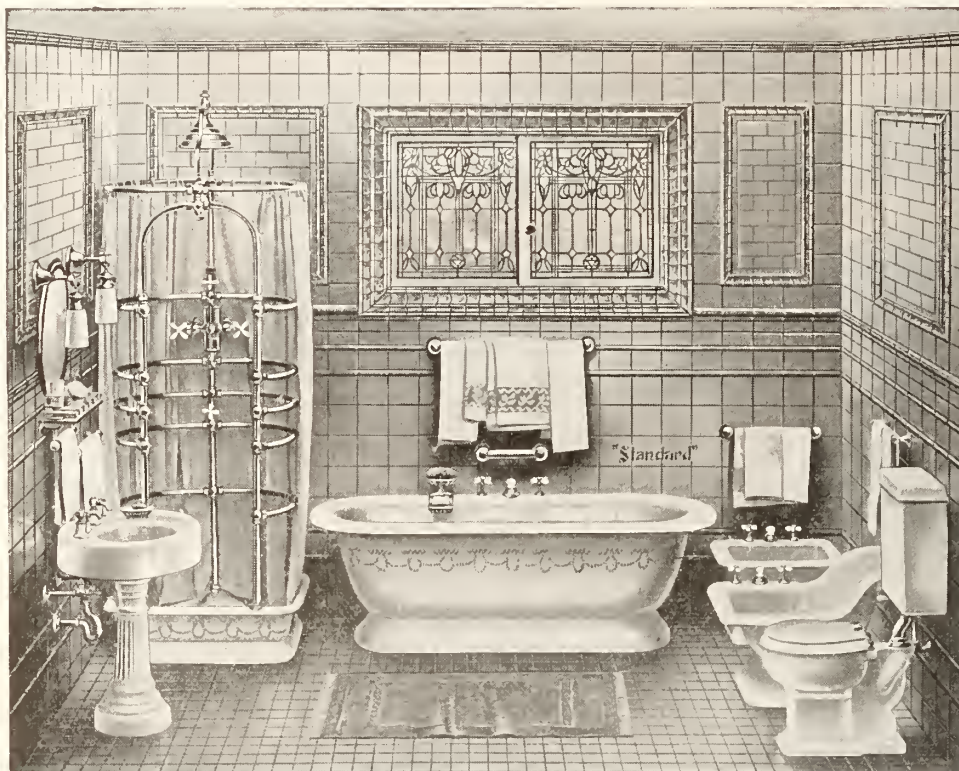
VANCOUVER

CATALOG FURNISHED UPON REQUEST



"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

"Standard Sanitary" Plumbing Fixtures



"Standard Sanitary" Bathroom of Queen Victoria of Spain.

The above cut was made from a photograph of the fixtures actually installed in the Royal Palace of La Magdalena, Santander, Spain, the summer residence of their Majesties, the King and Queen of Spain.

A similar bathroom was also installed for the King, and eighteen other complete "Standard Sanitary" Bathrooms for the other members of the household.

This is an extremely practical and beautiful interior and combines with beauty and refinement every modern sanitary idea.

The fixtures are set into the tiling, thus offering no place for dust or moisture to collect, and reducing cleaning labor to a minimum.

The Foot, Sitz and Shower Baths make an unusually complete and artistic bathroom at a cost that is very reasonable, considering the quality of fixtures shown.

"Standard Sanitary" plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales-agents throughout the Dominion.

Standard Sanitary Mfg. Co., Limited

General Offices and Factory:

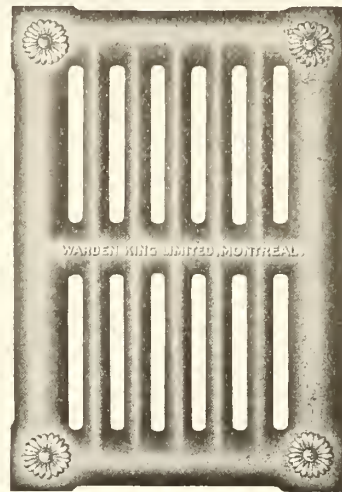
ROYCE AND LANSDOWNE AVES., TORONTO, ONT.

Toronto Store:
55-59 Richmond Street East.

Hamilton Store:
20-28 Jackson Street West.

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

Just Out!
 The New
“VIKING”
RADIATORS



These are the latest additions to our products, and are the neatest Radiators on the market to-day. They are fully described in our new Catalogue. Send for a copy at once.

We are the sole manufacturers of the celebrated “Daisy” Hot Water Boiler. Over 50,000 in use. This speaks for itself, and repair parts, if necessary, for any of the different styles, may be obtained at once.

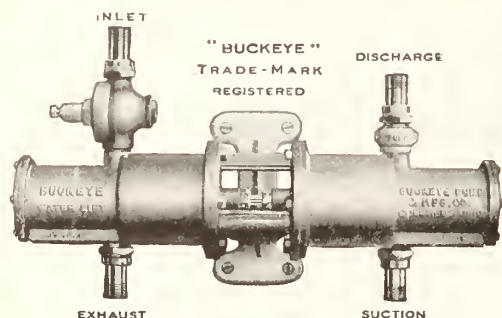
WARDEN KING LIMITED, MONTREAL
BRANCH, 200 Adelaide St. West, TORONTO

**AGENTS
 IN
 CANADA**

The CRANE & ORDWAY CO., WINNIPEG, MAN.
 The MECHANICS' SUPPLY CO., Limited, QUEBEC, QUE.
 The JAMES ROBERTSON CO., Limited, ST. JOHN, N.B.
 The WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

“When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.”

The "BUCKEYE" Trade-Mark Registered Water Lift Pump



For Automatically Supplying Cistern Water for Laundry, Baths, Etc., in Residences

The "Buckeye" Water Lift is an Hydraulic Engine operated by the city water pressure, used to pump soft or rain water from a cistern directly into the house pipes for domestic use.

The "Buckeye" is automatic and noiseless, working only when water is being used, stops when consumption ceases—one cylinder producing the power, the other lifting or forcing the soft water into the house pipe.

The "Buckeye" is by far the simplest Water Lift made, as it only contains SEVEN PACKINGS or CUP LEATHERS, and only TWO STUFFING BOXES, and less than half the parts that go to make up other Water Lifts.

The principle of the "Buckeye" eliminates all possibility of sticking or stopping on centre.

EASILY AND QUICKLY INSTALLED.

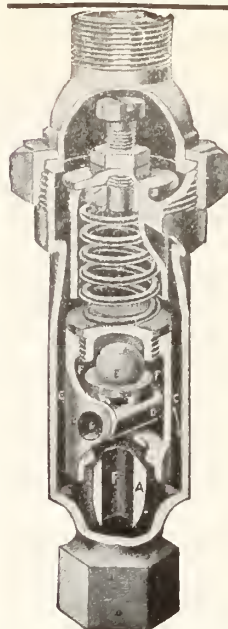
The lettering and appearance of both sides of the "Buckeye" are the same, so it may be installed either right or left hand.

The connection on both power and suction ends are straight up and down, thereby saving time in installing.

Check valve on pump discharge does away with the necessity of placing check in line, prevents any back pressure on motor from hot water tank.

Write for descriptive booklet and price.

The
**Buckeye Pump & Manufacturing
Company**
Columbus, Ohio



What about the Spring in the

B

Heat Intensifier?

The maximum capacity of this valve is
3,000 Square Feet of Radiation

When the water contained in this amount of radiation is expanding to its limit—the spring compresses only

1-8 inch.

It cannot move further and this compression would not weaken it in a hundred years—who of us will be alive at the end of that time?

Use the Intensifier and also the "B" Pipe Joint Compound when installing it.

NATIONAL STEAM SPECIALTY CO.

24-26 Clinton St., Chicago
Surpless, Dunn & Co., 74 Murray St., New York
L. N. Vanstone, 8 Wellington St. East, Toronto
Moncrieff & Endress, Limited, Scott Bldg., Winnipeg

300,000 lbs.

carried in stock for immediate
shipment of

Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

Brass and Copper Rod.

Brass and Copper Sheet.

WRITE US FOR PRICES

Tallman Brass & Metal Co.
HAMILTON, ONT.

G.M.C. WATER SYSTEMS

A Word About Tanks

Our Welded Tanks are tested to 200 lbs. pressure and guaranteed absolutely air-tight. We recommend and furnish them with our small systems. For Hydro-Pneumatic Water Service there is nothing better.

Our Riveted Tanks are tested to 150 lbs. pressure. They are made to Standard Specifications, and guaranteed equal to the best. We furnish Riveted Tanks with our larger systems because they are less expensive.

Do not confuse Hydro-Pneumatic Water Service with Range Boiler Service—They are quite different.

Ask the Range Boiler Manufacturer to Guarantee His Tanks for Hydro-Pneumatic Water Service. He will refuse.

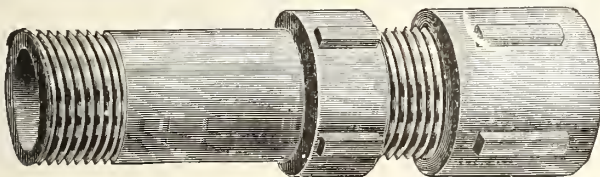
Enough Said

The General Machinery Co., Limited

22 Mulock Avenue, Toronto, Ontario

The "CLIMAX" Specialties

for Plumbers, Steamfitters and Gas Companies



"CLIMAX" Super-Excellent Long Screws

prevent leaks and loss by waste.

Leaks from the following causes cannot occur when the "Climax" Long Screw is used:

Sections of pipe not being in perfect alignment, preventing face and seat of union making complete contact.
Jars and vibrations loosening lock nut of union, grit or foreign matter getting on union seat.

Pipe connected under strain, as when right and left is used, or the right and left coupling not exerting some pressure on each thread. A good safe connection can be made by anyone capable of screwing up pipe.

Made in sizes 1/4" to 2" inclusive, black and galvanized.

Climax Specialties are stocked by the leading Canadian jobbers.

THE G.M. KEMP MFG. CO.
405-413 E. OLIVER STREET
BALTIMORE, MD.

"Climax" Automatic CELLAR DRAINER

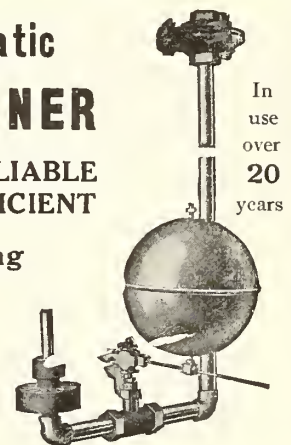
**DURABLE
SIMPLE**

**RELIABLE
EFFICIENT**

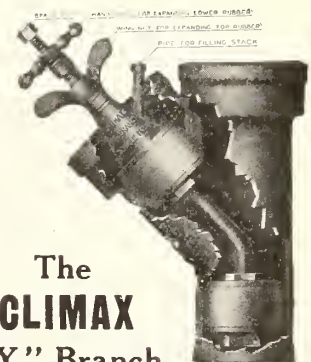
Valve won't hang

Smallest consumption of live water for dead water discharge.

Latest addition to the CLIMAX family of plumbing specialties. All plugs from 3 in. to 10 in. sizes fitted with threaded connection for water. By turning hand wheel to right, rubber on lower plug is expanded. The upper plug rubber is expanded by turning wing nut. Light, durable and simple. By revolving hand wheel to left, the water in stack is permitted to flow into sewer.



In use over 20 years



**The
CLIMAX
"Y" Branch
Double Plug**

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

SAFETY FIRST

Is as applicable to Hot Water Heating as
it is to Railroad Operation.

The Honeywell Heat Generator

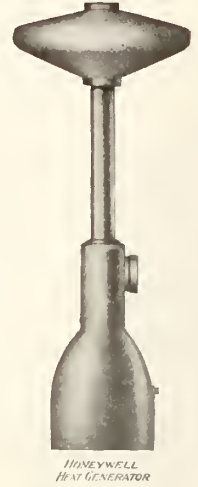
Beware of the use of dangerous mechanical valves for sealing Hot Water Heating Systems.

The use of mechanical valves for this purpose is prohibited in England and in many cities in the United States.

There are no restrictions on the use of the Honeywell Heat Generator. It is universally recognized as the only safe and dependable seal for Hot Water Heating Systems.

Thousands of Honeywell Systems are in use throughout Canada and each year a larger number are installed.

Write for our complete catalog and instruction book.



HONEYWELL
HEAT GENERATOR

HONEYWELL HEATING SPECIALTY COMPANY

NEW YORK OFFICE:

Herald Square Bldg., 141-145 W. 36th St.

WABASH, INDIANA

BIRMINGHAM, ENGLAND

MONTREAL OFFICE:

1008 Eastern Townships Bank Building

PEASE IDEAL STEAM BOILERS

Write to-day for
Catalogue and Prices.

PEASE FOUNDRY COMPANY
LIMITED

Works: Brampton. Head Office: Toronto.
Branches: Vancouver, Winnipeg, Hamilton, Montreal.

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal

Works: Lachine Canal

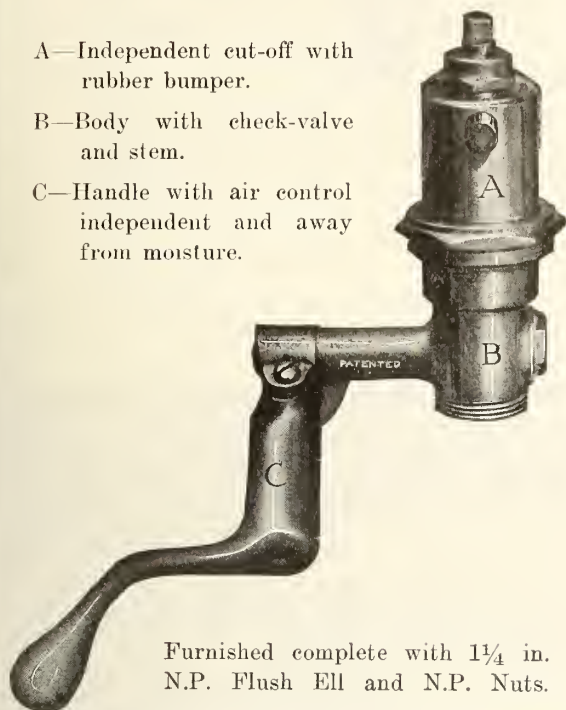
"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

Wolverine Flushometer

PATENTED

Durable - Inexpensive - Economical - Simple

- A—Independent cut-off with rubber bumper.
 B—Body with check-valve and stem.
 C—Handle with air control independent and away from moisture.



Furnished complete with $1\frac{1}{4}$ in.
 N.P. Flush Ell and N.P. Nuts.

The only Direct valve on the market.
 No small by-passes to stop up or corrode and each valve is furnished with independent cut-off with rubber seat bumper.

Flush can be adjusted without shutting off the water.

For Direct pressure or gravity systems.
 Write us for price and further information.

Manufactured and guaranteed by

Canadian Wolverine Co.
 LIMITED

Chatham, Ont.

Porcelain Plumbing Fixtures

More Sanitary (being absolutely vitreous)
 and as cheap as the out-of-date Cast Iron
 Enamel.

We carry a full range of Lavatories, Sinks,
 Urinals, Baths and Laundry Trays.

Write for prices and full information to

R. HARTRIDGE & CO., LIMITED

Head Office and Showrooms :
 223a 7th Avenue West, Calgary

Branch :
 61-3 Albert Street, Winnipeg, Man.

Sole Agents for
 SHANKS & CO., Ltd., Barrhead, Scotland ED. JOHNS & CO., Ltd., Armitage, Staffs., Eng.

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SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, APRIL 15, 1914

No. 8

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The MacLean Publishing Co., Limited

JOHN BAYNE MACLEAN, *President*
T. B. Costain, *Managing Editor*

ESTABLISHED 1888)

H. T. HUNTER, *General Manager*
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CHIEF OFFICES:

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GREAT BRITAIN—London, Eng., E. J. Dodd, *European Manager*, 88 Fleet St., E.C., Telephone Central 12960.
UNITED STATES—New York, R. B. Huestis, 115 Broadway, N.Y., Telephone Rector 8971; Chicago, Ill., A. H. Byrne, 140 S. Dearborn Street, Telephone Randolph 3234; Boston, C. L. Morton, Room 643, Old South Building, Telephone Main 1024; Cleveland, T. E. Klein, 1246 Thoreau Road, Lakewood.

*No Joints
to Open Up*

VITRO

NO TROUBLE TANK

*No Linings
to Leak*

These tanks are beautiful in design, and handsome in finish—and exceedingly durable.

Best quality ingot metal is used for the fittings, which is insurance against sand holes and other imperfections.

Over
150,000
in Use

Each and every fitting is tested and adjusted under working water before leaving the factory.

We guarantee to promptly give a new tank to replace one that proves defective at any time in material or workmanship.

Write for full information.

SOLD BY ALL JOBBERS



Cluff Manufacturing Co., Limited

Office and Factory: 65-75 Sterling Road, Toronto, Ontario

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STEEL AND RADIATION, LIMITED

"KING" BOILERS



No. 6. High Base "KING" Boiler, Showing Double Shaker.

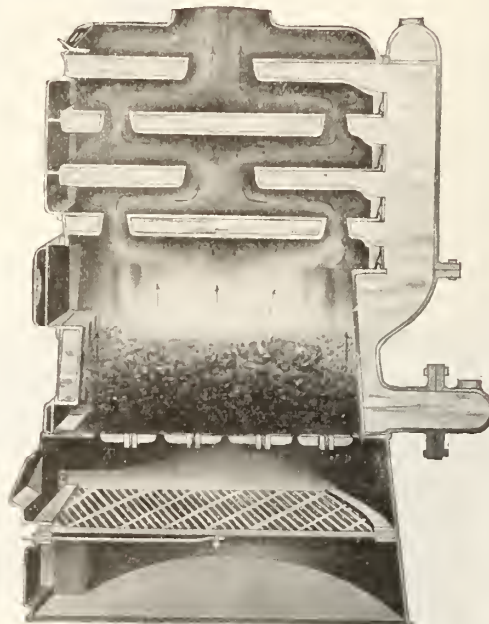
A Hot Water Boiler That Is Standing The Test.

"KING" Boilers carry our unqualified guarantee.

Mr. Heating Engineer,—

Isn't it worth something to deal with a house that has faith in its product and will stand behind the goods they manufacture?

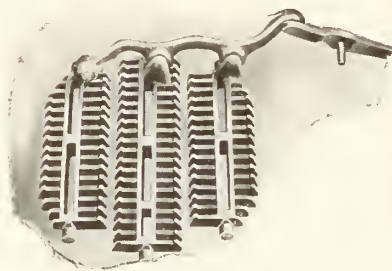
The talking points on a "KING" Boiler are numerous, in fact too numerous for us to attempt to explain them in this limited space. A few of them need no explanation and are shown in the accompanying cuts.



Sectional View of "KING" Boiler, Showing Improved Design of Waterways, Combustion Chamber and Fire Travel.

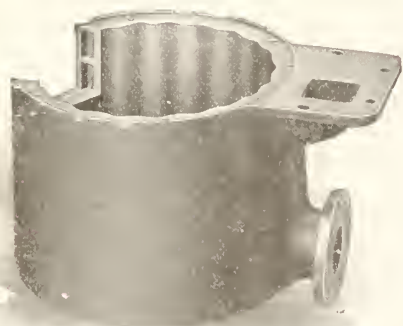
"SPECIAL FEATURES"

The large one-piece ashpit.
The special shaking grates and convenient shaking arrangement.
The fire-pot with a real corrugation.
The well-arranged and properly proportioned combustion spaces.
The easily-cleaned flues.
The double shaker.



Grate Bars and Connecting Bar, Showing Method of Connection Without Bolts or Pins.

The perfect fit doors.
The thin and rapid circulating waterways.
The extended and scientifically arranged heating surfaces.
The absence of defective sections on account of the use of iron patterns.
The ease of erection.

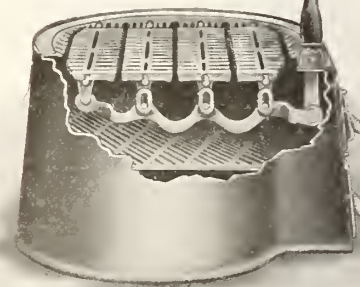


"KING" Fire-Pot. Showing Wide Corrugation, Adding One-third to Heating Capacity.

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THE SANITARY ENGINEER

VOL. VIII.

APRIL 15, 1914.

No. 8

The Spirit of Co-operation Necessary

Showing the Need for More Co-operation Amongst the Craft If Sanitary Engineering is to Cope With the Demands Made Upon It.

ONE of the most striking features at the recent provincial convention, held in Toronto, was the need for more co-operation amongst members of the craft, whether members of the Society of Domestic Sanitary and Heating Engineers or not. In spite of the feeling which the public have for sanitary and heating engineers as a whole, the fact remains that there are no millionaires in the craft, and each and every one at present engaged in the trade knows full well the struggle there is to keep things going.

It is an impossibility to do justice to one's self by way of remuneration when one is asked to do so much estimating for and inspection of jobs which one never gets. The writer has a certain contract in mind where several sets of plans were submitted, all free of charge, and the time and professional knowledge which went into the make-up of both the plans and tender must have cost at least \$100. Of course, the public cannot be blamed for asking that such plans and tenders be given free. But why such a policy? It simply requires a little co-operation in the craft, a little more study, and a little more thought given as to the value of one's time. It has been said by several great thinkers that time is the only thing which cannot be monopolized, but such is not the case with sanitary and heating engineers. The public monopolize on an average at least 20 per cent. of their time, and think nothing of it. How many men who do not employ more than four to six men find at the end of the day that had they been working for someone else they would have been money in pocket, and who find it a hardship to make things go, all because of the need for more co-operation amongst employers? We do not mean that the craft should in any way fix upon any set plan how to carry on their business, but rather that they should meet together and discuss the various evils which are becoming a drag upon those engaged in the craft, such as giving estimates free, inspecting work or giving advice free. At such

meetings members of the craft could discuss the by-laws in existence in their towns, with a view of keeping them up-to-date. The exchange of one's daily experiences would become of great value if discussed with each other. One of the chief reasons why trade unions have progressed to the extent they have is because of their meeting each other regularly and discussing the various topics of interest to themselves as journeymen, and in many ways they are to be envied for the way they stick together. There is no necessity of giving one's business secrets away when discussing the various topics of interest, and one of the most interesting matters to take up at present would be the necessity of a uniform set of laws to govern sanitary heating and ventilating engineering.

Let us cite the present struggle in the Maritime Provinces to secure some legislation to place practical men on boards of health, to demand that only practical men be appointed as inspectors of plumbing and works of a sanitary engineering nature; and look at the way a certain class of the members of Parliament take the stand that a "plumbers' trust" will eventually be the outcome of such legislation. Such a conclusion is ridiculous. No member of Parliament can possibly be in his right senses who would be the victim of such an idea. What is really wanted is some law to govern the proper installation of such work and nothing more. The whole Dominion is in the hands of a lot of botches, and the public are paying for it. While there, no doubt, is some splendid work being done in our line, there is also a great deal which is not, simply because there is no authority to speak of over sanitary, heating or ventilation in small towns and rural districts, and many of our large cities are cursed with incompetents, both journeymen, employers and inspectors. It is because of such a class that practical men should be put upon boards of health and into positions of inspectors, all with a view of safeguarding the lives of the public. To obtain such laws as will require prac-

tical men to be put into such positions, the craft will need to co-operate and show the public where they stand. Our water supplies are polluted; our lakes, rivers and streams are putrid; our village wells are becoming polluted, and a thousand-and-one evils exist, because of the need for co-operation. One member of the craft can bring the whole of its members into disgrace by installing a cesspool too near a well, the water from which is used for drinking purposes. Another may tender on the same job, but plans to put in a septic tank, and on account of price loses the job, and very few people know the difference between a cesspool and a septic tank, therefore the cesspool still holds sway in many districts. Even where there are plumbing by-laws in existence, cesspools are being installed, but are called septic tanks. We cited an instance some weeks ago in Sanitary Engineer. Now, if the craft would co-operate and exchange their views on matters of that kind look what a benefit the public would derive from it, and the day would not be far distant when they would begin to see that sanitary engineers are in reality benefactors to humanity.

A few days ago the writer had some conversation with a man who began to "lay the law down" about sanitary engineers. It seems he had recently got a new double bath cock put on his bath, and in about three weeks' time it began to leak as bad as the old one had done when it was taken out. He sent for the sanitary engineer, and was told that the sand in the water in Toronto played havoc with all taps, etc. What a poor excuse! On the writer looking at it, he found it to be one of the cheapest lines that could be procured, and one which cost the customer \$3 installed. Now this member of the craft has lost a good customer worth more than \$3. He might just as well have carried a good line of bathecks, charged a fair price, and given good value, and in that way gained a good customer. This person explained to the writer that he would never have questioned a higher price if he had got

value, and in the end he got another bathcock installed, and had to tell the sanitary engineer he wanted one which would not be liable to get out of order owing to "sand" being in the water. Such instances as this do not reflect credit upon the craft, who, by meeting regularly and discussing their experiences about goods, about conditions, about the thousand-and-one troubles met with from all points of view, would in the end reap great benefits, which would enable each and every one engaged in the trade to give better service to the general public, and also show them what we as a whole are striving to attain. If sanitary engineers are to keep pace with the progressive demands made upon them they will have to not only co-operate, but also explain to the public their reasons for so doing.



THE SNOW WHITE PLUMBER.

The Master Painter, (Malvern, Pa.), tells this romance of modern business, almost good enough to be true:

"Some years ago there was a plumber in a Western city where soft coal predominates. Rivals had cut into his business until he bethought himself of the efficiency experts and sought advice as to how he could increase his business. The expert said: 'If you will follow my advice I will guarantee to double your business. Paint your shop white without and within. Dress your employees in white, with white shoes; give them white canvas bags in which to carry their tools; let them wear white caps and white shoes while at work, and then advertise yourself as the White Plumber.' This advice was followed. The man was at considerable outlay for white overalls, jumpers, etc., but business at once began to grow like magic. The housewife who reluctantly admitted the ordinary mechanic with greasy overalls and grimy tool-bag, had no apprehensions for her floors and rugs when one of the 'white plumbers' arrived. The venture was extremely profitable, and it may be stated that any form of distinctiveness, such as color, combined with advertising, is almost a sure recipe for success. The combination is strikingly fruitful."



Brantford, Ont.—The United Rubber Co., reclaimers of old rubber, have purchased the Farmers' Binder Twine Co. factory, and after installing machinery, will start operation with thirty hands.

Halifax, N.S.—It is understood that at the next annual meeting of the Nova Scotia Car Works, Ltd., announcement will be made that the company proposes to enter on the manufacture of structural steel.

Canadian Institute of Sanitary Engineers

Will Hold Their Next Convention in Edmonton, May 4, 5 and 6.

TENTATIVE PROGRAMME.

The following subjects of interest will be discussed along with others which will be decided upon at a later date.

Monday, May 4th, 10 a.m.

Registration of Delegates. Reading of Minutes. Applications for Membership.

2 P.M.

Sizes of Soil, Waste and Vent Pipes. Pipe Terminals.

Tuesday, May 5th, 10 A.M.

Standardization of Pipes and Fittings.

2 P.M.

Rain Water Leaders. Election of Officers. Place of Next Meeting.

Wednesday, May 6th, 10 A.M.

Examination of Plumbers. General Review of By-Law.

2 P.M.

General Discussion.

Every member is urged to be present as a great deal of work has been done by the various branches, and much benefit will be received. The titles of the subjects speak for themselves, which if given justice to a reasonable extent are bound to be helpful to one and all present. On another page will be seen a very interesting article entitled, "Standardization of Cast Iron Soil Pipe and Fittings," by Wm. McFarlane, Assistant Plumbing Inspector, Winnipeg, which goes to show that the members of this institute have not allowed the grass to grow under their feet during the past year.

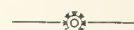
One of the aims of the convention last year at Winnipeg was to frame a uniform plumbing by-law for Western Canada, but so many contentious matters came up, it was decided to postpone discussion of the matter until certain experiments had been made. There will be a full discussion of the various points at this year's convention at Edmonton. Matters that will come up under this head will be: sizes of soil and vent pipes, proper method of constructing pipe terminals at roof, standardization of pipes and fittings, and the advisability of introducing the examination of plumbers before granting licenses.

The examination of plumbers is carried out in Calgary, Saskatoon and Edmonton at present, but not in such large centres as Winnipeg, Vancouver, Brandon, Regina, and Fort William.

All over the West members of the institute have been holding meetings during the past winter, when these matters have been thoroughly discussed. Reports from these centres will be submitted to the convention. Invitations have been sent to master plumbers' and journeymen's unions in all the cities throughout the West to attend this convention, irrespective of whether they are members of the institute or not, as it is

felt that they should be consulted in the formation of this by-law, in order that they may share the responsibility, and in the hope that they will more loyally adhere to its provisions when adopted.

H. Nash and J. R. Huntbach, of Edmonton, are working hard making elaborate arrangements for the entertainment of delegates to the convention, and will see that none of them get lost while up there. An entertainment committee is arranging for a theatre party on Monday, May 4, a banquet for Tuesday, and a smoker for Wednesday. Arrangements are also being made, should weather and time permit, for an automobile trip. There will be special convention rates on the railways, and negotiations are going on with the hotels for special accommodation.



T. J. Brown, general superintendent of the Nova Scotia Steel and Coal Co., and Vincent McFadden, chief electrician of the Dominion Coal Co., Glace Bay, N.S., are members of a commission appointed by the Nova Scotia Government to inquire into the advantages or otherwise of electricity for light, heat and power in coal mines. The commission visited Sydney last week.

Problems in Sheet Metal Work

SOME time ago we showed how to develop pattern for a register box, or a round to square. In this issue we are about to show a pattern which is in many ways a similar kind of a pattern except that the base is not straight, but rather at an angle as shown in perspective drawing, Fig. 1. Such are known as tapering roof flanges for inclined roof.

The first thing to do is to determine the pitch of the roof. If the roof is an old one, or already built, and there is no plan showing the pitch, a very easy way is shown how to get the proper pitch as seen in Fig. 2.

Place two pieces of lumber 1 in x 2 and long enough to manipulate as shown X.X. Then by using the square and level in the way described, the pitch is determined at B.B., placing the level on horizontal piece, then B.B. will give the correct bevel required.

Now to proceed with the development

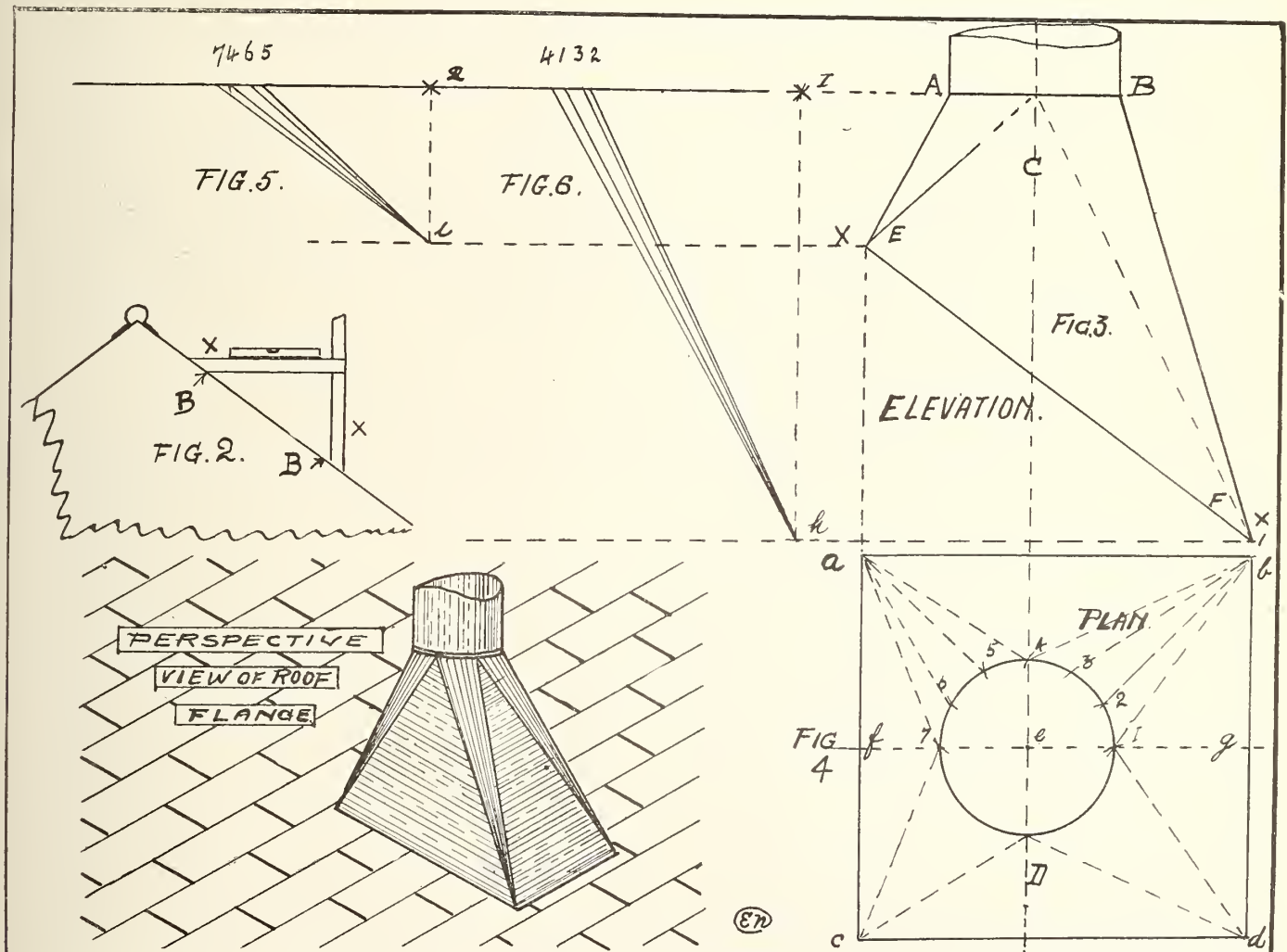
of pattern, assuming line X. & XI. in Fig. 3 to be the slant which the flange is to have so as to fit the roof, and A. B. the diameter and position of pipe, erect a vertical line C.D., which must be centre of pipe. Next draw the two line down from A. B. to X. & XI. Having done so erect vertical slanted dotted lines from XI. and X. to centre of solid line A. B. We have now got a true elevation plan of the whole flange. We will now proceed to develop Fig. 4, by forming a square a.b.c.d. being formed by extending downward from E.F. in Fig. 3, and squaring the results as shown in Fig. 4, then intersect this square in centre horizontally as shown at f.g. resulting in getting the centre shown at e., from this centre draw a circle which will be the exact diameter of the pipe, and at the same time establishing the position of pipe in the flange.

Next space off as shown in 1, 2, 3, 4, 5,

6, 7, all of which must be perfectly equal, having done so, draw the dotted lines as shown a4. a5. a6. a7., also b4. b3. b2. b1., thus ending development of Fig. 4.

We will now turn to Figs. 5 and 6. First extend the horizontal lines A.B. and another line from XE. and XI., Fig. 3, as shown, the top line solid, the rest dotted, then draw vertical dotted lines downward from line at top as shown at XI. to h. and Fig. 6, X2 to i., Fig. 5, we will now proceed to determine the true lengths of slant lines by placing compass point at bI., Fig. 4 and transferring this to horizontal line Fig. 6. Next b2, b3, and b4, as shown 4, 1, 3, 2, then and repeat the operation in developing Fig. 5, by using a7, a6, a5, a4, from X2, giving 7, 4, 6, 5, as results, and erecting slant lines from i to the latter numbers.

NOTE.—This problem will be concluded in our next issue.—Editor.



The Sanitary Engineer

Plumber and Steamfitter of Canada

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TORONTO, APRIL 15, 1914

STANDARDIZATION OF SOIL PIPE AND FITTINGS.

ON another page we are submitting a paper which will be read and taken up for discussion by the Canadian Institute of Sanitary Engineers at their coming convention. This paper is as it were a report of the conditions they have found to exist in connection with soil pipe in the Western provinces. Upon such evidence, we feel sure the time is ripe to ask that some standard be fixed. Sanitary engineering has taken such rapid strides recently that no doubt the fittings particularly should receive some attention. The charts which are submitted with the article mentioned show exactly what changes are suggested, and every one who studies the designs cannot fail to notice the decided improvement which will take place if such changes are agreed upon. Soil pipe fittings as a general rule are altogether too short, thus causing poor joints to be made.

DOMINION SANITARY LAWS.

THIS subject is one which we are told will be taken up at the convention to be held in Ottawa in June, and if justice is done to the subject it will be interesting. Looking at the various reports received in reply to letters which the Ontario association sent out, one cannot fail to see how necessary such laws are. No one can cope with a subject of such magnitude as ably as the Dominion Parliament. The Federal Government could watch developments all over the world, and get data of every kind which would in the end be of assistance to every province and municipality throughout the Dominion. The Federal Government could arbitrate in questions of water supplies as well as the disposal of sewage, where one Province required its water from another, or where on account of conditions of a geological nature it was found to be necessary to dispose of sewage from one Province in another. If the question of sanitation is taken up properly a thousand and one questions will arise, which will need the assistance of the Dominion Government.

The maritime Province is only like every other Province in Canada which is seeking to place competent men on its Boards of Health, to employ practical men to inspect work which is being installed in our dwellings, and to allow none but experienced men to do the installing of

such important work. That's the bogey which is abroad. Let's hope it will have long life and prosper.

YET ANOTHER TRUST.

THE newspapers took up the cry of "Bath Trust" and higher prices during last week, all before actual facts were obtained; and when all the facts were received it simply amounted to this, that in future there would be no price-cutting methods tolerated. Price-cutting in any line of calling only brings ruin in its train. Such a cry would be better justified if the public were being charged a higher price for baths and other sanitary appliances, whereas the facts are that while almost every commodity of diet or clothing, rents, land, etc., has gone up in price, baths, lavatories, brass goods, etc., have actually decreased in price. It is not many years ago when the public were paying \$22.00 for a bath which to-day can be bought for \$18.00, all because of the manufacturers adopting new methods for the production of same. But we do not hear a whisper to that effect. Why? Because such statements would reflect too much credit upon sanitary engineers.

PLUMBERS' TRUST.

IN our last issue we mentioned that a bill was before the local Legislature at Fredericton concerning improvements and progress in the sanitary engineering trade. We were then informed that it was possible that some opposition would be met with, and that politicians (only) voiced in strong terms that such a bill would, if passed, result in a "plumbers' trust" or combine. Politicians as a whole are merely individuals who have become inoculated with "politics," and up to the present date politics have taken no active part in sanitation, neither physically, mentally or morally. Politicians have allowed upwards of \$10,000,000 to be spent on the military department, but not ten cents on sanitation, and they, like the public in general, know so little about works of a sanitary nature, that their first cry is that the "trust bogey" is abroad. If sanitary engineers could get a hearing and state their case through the press in a fair, unbiased way, the public would know why they are being overcharged for work done.

Letter of Appreciation.

The Toronto Society of Domestic, Sanitary and Heating Engineers

J. E. FULLERTON, Secretary,
89 Concord Avenue.

Phone, College 7022.

Toronto, Ont., April 7th, 1914

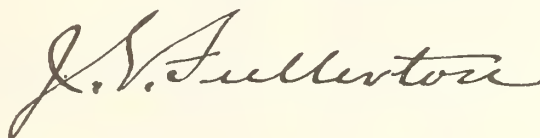
The Editor, "Sanitary Engineer,"
Toronto.

Dear Sir:

Your article in issue of March 2nd,—
"SHOULD SANITARY ENGINEERING BE UNDER THE
JURISDICTION OF THE ARCHITECTS?"—touched
on a subject which is being dealt with by
the Executive of our Society, and was,
therefore, of great interest to all our
members. The article referred to was read
at our last general meeting held on March
16th, and the members present expressed
their hearty appreciation and fully en-
dorsed your stand in this matter, and I
was instructed to write you and extend
their hearty co-operation and approbation
of the very able manner in which you are
endeavoring to remedy the many evils of
our Craft.

Wishing you every success,

Yours very truly,



Secretary.

PLUMBING AND THE MODERN NOVEL

BY FRANK M. O'BRIEN

ILLUSTRATED BY THELMA CUDLIFF

Reprinted by permission from Munsey's Magazine

THE most mysterious professions in the world—outside of alchemy and politics—are literature and plumbing. Literature is mysterious because few understand why it is done and plumbing is mysterious because only the elect know how it is done.

Literature has this advantage over plumbing: that it occasionally leads to glory. There is no Nobel prize for a non-freezing hydrant. Plumbing has this advantage over literature: that you can't get along without it. Nobody, on being informed that a frozen pipe had split under eighty pounds' pressure, ever yawned and remarked that he would look it over some night when he had nothing to do. Literature never hears the wild human call that plumbing hears.

A man who goes into his library and finds the table bare does not ring up Louis J. Vance's hotel and tell him to hurry down with a novel. But when the man goes into his kitchen and finds the hot water boiler giving an impersonation of a demented shower bath he does not wander away to play billiards. He winds himself around the telephone and S O Ses to the plumber.

Plumbing can get along without literature, but literature cannot get along without plumbing. True, it used to, but that day is past. Poets ignore plumbing, but that is because poetry, like Brooklyn baseball, is in its infancy. Writers of tragic drama ignore plumbing only because the absence of plumbing makes their tragedy more stark. A course of cold baths probably would have cured Ophelia—and spoiled the greatest of tragedies.

But the live writings of the day—the novels—do not ignore plumbing, or when their authors fail in their bounden duty, the result is a fiasco.

Not always does plumbing stalk through the pages of the novel with its pack slung over its shoulder. Sometimes plumbing is inferred. Writers of novels that deal with Fifth Avenue and Newport do not pipe their pages. But in their works plumbing is none the less present because it is inferred.

You know without being told, when Cortlandt Van Bink strides down the avenue, bowing hither and thither with the only silk hat in all daylight New York, that he has just come from his tub. Robert W. Chambers, for instance,

This story is about the best the writer has ever had the privilege of reading in many ways. It has its humorous as well as serious side. Frank M. O'Brien, in writing "Plumbing and the Modern Novel," has credited the craft with being amongst the elect, and the fact that the novelist, as well as the public, do not give this class of craftsmen the credit that is their due is because of the actual skill which a man requires to become a practical craftsman, and because of the lack of knowledge which the public have of the trade. Any person can make a fair attempt at doing a simple job of carpentering, painting, paper-hanging, glazing and a thousand other jobs around the house, but not one in a thousand could permanently stop a leak in a lead pipe.—Editor.

exciting chapter, he found for her a cool, deep pool completely surrounded by a thicket; and she had everything else in her saddlebags except a glass towel rail, and that, of course, can be dispensed with in time of war.

Less fortunate in his climate, but bolder in execution, was Emerson Hough in "54-40 or Fight." Mr. Hough was obliged to move his dashing heroine, the Baroness von Ritz, from Washington to Montreal in the dead of winter. There the hero found her in a residence in the old French quarter to which she had



A COURSE OF COLD SHOWER-BATHS WOULD PROBABLY HAVE CURED OPHELIA

makes you feel that every one of his city heroines is on good terms with the porcelain. But he knows where plumbing belongs and when it must have a substitute if it cannot be there itself.

His lovely girl in "Special Messenger" lived in the time of the Civil War, when the plumber's wagon will not follow the flag. So every night, at the end of the

moved all the furniture that had graced her Washington abode.

According to this same hero, who tells the story, the Baroness brought bathtubs—yes, plural—with her. From his room he overhears, and reports:

"No, I think the pink one," I heard her say, "and please—the bath, Threlka, just a trifle more warm." I



NO INDIAN, IN FICTION OR OUT, COULD EVER BE INDUCED TO CARRY A BATH-TUB

heard the rattling of toilet articles, certain sighs of content, faint splashing beyond.

He had the other tub—at the other end of the house.

Mr. Hough may deceive the ordinary reader of the best seller, but not the student of Plumbing's Relation to Literature. He leaves the reader to infer that the Baroness had carted two bath-tubs up the Hudson River and by way of lakes and mountain passes to Montreal. Your red Indian of the Roaring Forties was a strong, brave fellow. We are willing to believe that he packed rugs, pictures, bric-a-brac, sofas, chairs and mahogany bedsteads over the hills to Montreal. Yea, we will admit, for the sake of no argument, that a brawny redskin carried the Baroness's piano blithely through several hundred miles of storm on his patient shoulders. An Indian might carry a piano, which had charms to soothe his savage breast; but no Indian, in fiction or out, could ever be induced to carry a bath-tub.

An equally pitiful attempt to pander to the school of modern plumbing—or indoor bathing, if you choose to have it so—was made by Conan Doyle in "Sir Nigel." After piecing together a fine set of adventures for this gallant knight it dawned upon Sir Conan that Sir Nigel, though an Englishman, did not seem to have the tubbing habit. So Doyle lugged a bath-tub into the Middle Ages and set it down in the middle of Sir Nigel's room. He didn't dare have pipes of hot and cold water, with glistening faucets and all that. Nor did he dare make the tub of enameled iron. He

just stuck Sir Nigel in a wooden hogs-head of hot water and let other knights trot in to inquire what was up.

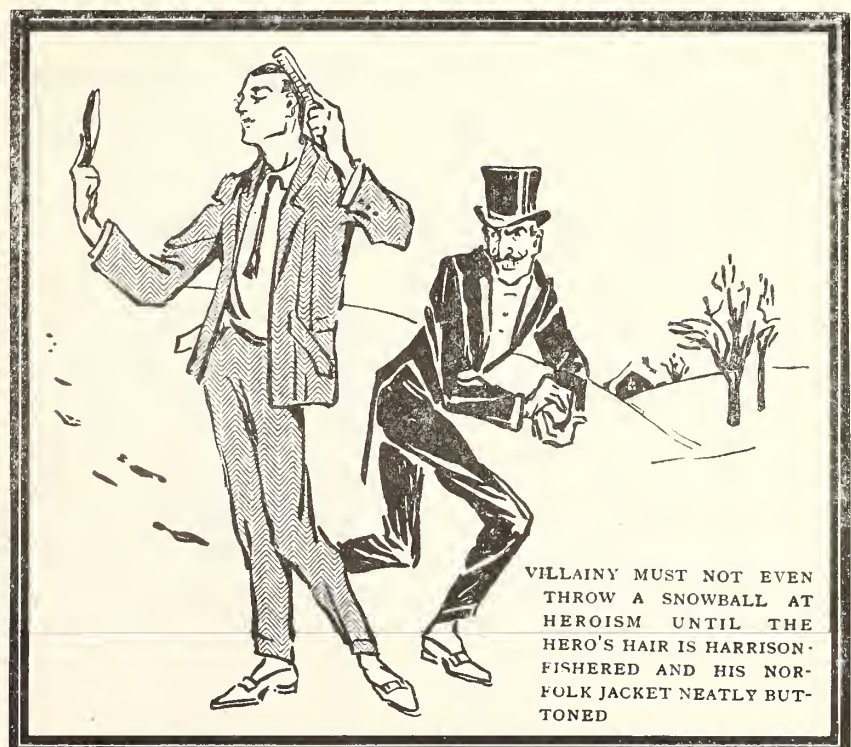
Mr. Maurice Hewlett, who is up on knights better than Sir Arthur knows them, never comes such a foolish bobble. Mr. Hewlett knows that no knight ever took a bath. A crusader would rather encounter a thousand savage Saracens than a bath-tub. Whenever in his judgment, one of his knights needed immersion, Mr. Hewlett had him knocked

on the head and he fell from the battlements, or the parapets, or what you please, into a moat full of nice clean water, floated around in full armor for an hour or two and then, tying his lady's scarf around his fractured skull, returned to the plot, clean and refreshed.

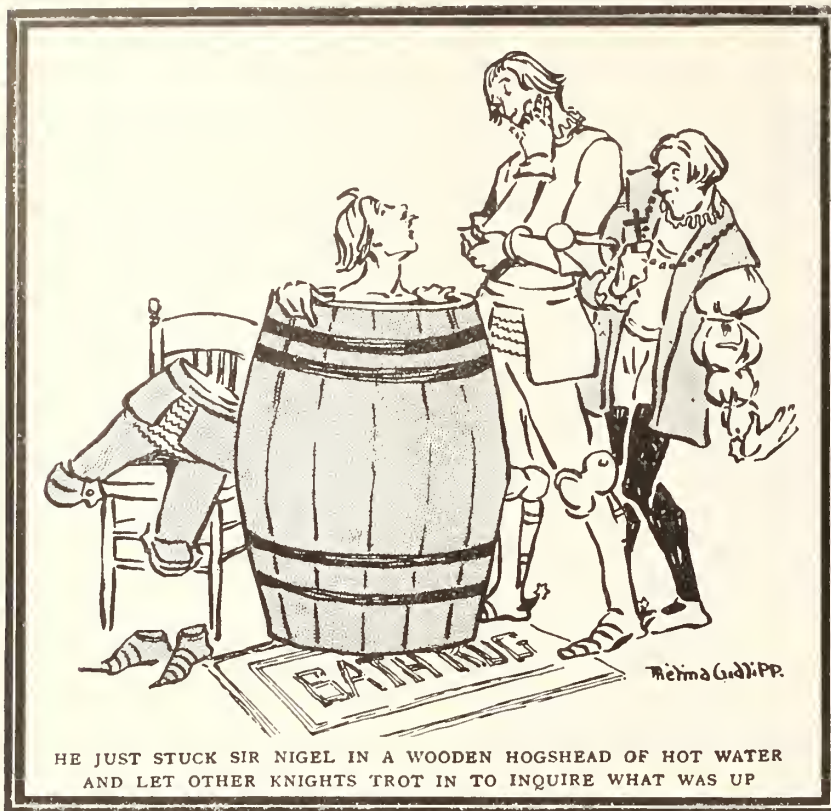
Yet you must excuse the faults of Sir Conan Doyle and others to whom the Stillson wrench is newer than the gleaming sword. They have been trying their best to make our novels hygienic, and it is only because they were not properly apprenticed in their youth that they fall down occasionally.

Truth to tell, the number of authors who have studied plumbing intimately may be almost counted on the thumbs of one hand. Arnold Bennett, who digs into the farthest dustiest corner of almost every other household thing, shies away from plumbing. Yet, if realism is what its worshipers think it is, why is not plumbing to the fore in every page? It is because the novelists shirk their duty.

They will tell you, in weary, infinite detail, how a table-cloth is scraped, folded and put away on the third shelf of the dining-room closet, slightly to the left of the package containing the summer curtains. But when they tell you that the room became chill and the heroine threw on her Indian shawl, using her right arm more vigorously than her left during the operation, do they tell you why the room became chill? Do they explain that the hero, running too much water into the boiler, left little space for the generation of steam? No. And that later he would have to draw



VILLAINY MUST NOT EVEN THROW A SNOWBALL AT HEROISM UNTIL THE HERO'S HAIR IS HARRISON-FISHERED AND HIS NORFOLK JACKET NEATLY BUT-TONED



off some of the surplus water into a bucket and then watch the steam-gage until it reached a pound and a half? Never. They would like to for it would wad the story out beautifully, but they are uneducated. Any one can describe a new human emotion and get away with it, but how many novelists can give a lucid explanation of the water-hammer that causes the noise in steam pipes? How many know that boiling water, abandoned to its fate in zero weather, will freeze faster than cold water—and why?

The realists have reeled back from the task that should be theirs. They assume, whether they are English or American, that a bath-tub is a bath-tub and that it has always existed for the use of characters "of the better sort." Little do they know that in a general catalogue, issued as late as 1883 by the largest plumbing firm in all London, the word "tub" does not appear. Hidden away in the back of the book is one page devoted to "baths," rude things of cast iron.

Yet the situation in America was worse, for the catalogue issued in 1888 by the largest plumbing house in New York had only a half page of bath-tubs—or rather, of a bath-tub, for there was only one of it. If it was not labeled bath-tub one would have considered it a rather ornate coffin for a \$57 funeral. It had all the walnut curlicues that could be thought of in the Chester A. Arthur period.

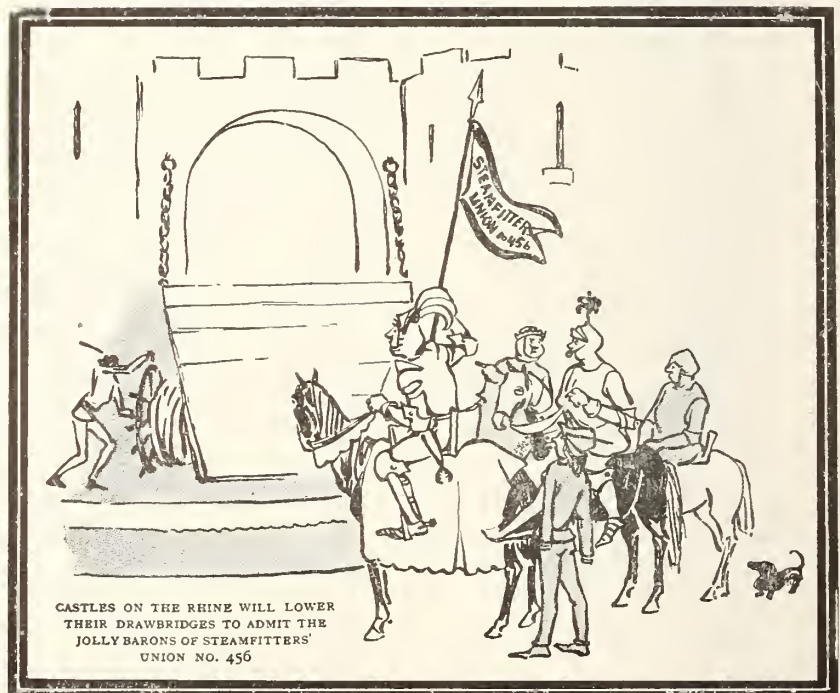
Those who bought one of these splendid pieces of furniture had only to take it home and have it lined with tin or copper and then arrange some method of filling it with water and emptying it again. And yet the novelists gloss over plumbing, which has advanced more in twenty years than they have in a hundred. They speak of it lightly, in a passing way, if they speak of it at all. They would have the reader think that they had known the solid porcelain all their lives and that the memory of a

wash tub in the centre of the kitchen floor on a Saturday night was not their memory at all, but a vulgar dream.

Only one of the novelists has mastered the intricate details of plumbing, and this one, strangely enough is not a realist, but an idealist. Yet he handles plumbing in a master-plumberly manner. This novelist is Arthur Stringer.

Mr. Stringer, on one recent occasion, brought a hero to an unoccupied farmhouse on the north shore of Lake Ontario in January. B-r-r-r-r-r! Then the character decided to stay in the house for a couple of weeks. Your ordinary author would have had the hero light up the furnace or put a roaring fire in the grate. Not so Stringer. He has dived into plumbing. He has followed the spoor of the $\frac{3}{4}$ inch galvanized. He has gazed upon the expansion tank brooding in its attic nest. He has learned that a water-front in anger is more fatal than the much-advertised manhole cover. He knows that you do not have running water in a house unless you have heat, that you do not start a fire under a boiler until there is water in the boiler, and that a grate fire in Ontario in January is a mockery full of vacuum.

A craven novelist would have faltered, but Stringer faced the music. He learned the pipes of plumbing as well as he had learned the pipes of Pan. Using his hero as a medium, he screwed the plugs back into the drain end of the water-pipes, opened the valves leading to the furnace boiler, blew the air out of the steam-pipes, oiled and connected the windmill and did the million and one things that one has to do in opening up a country house. When he got through,



the reader knew that the hero might be shot to death in the next chapter, but he would not be blown to slivers by a miffed boiler or drowned by his bedroom radiator.

As novelists come to see, with real eyes, the worlds of which they write, plumbing must loom up as more and more important.

If you read "Graustark" or "Beverley Thereof" you undoubtedly took it for granted that the heroes and heroines therein were slaves of the hot and cold, shower, shampoo and plunge. George Barr McCutcheon did not pipe the pages, but let the plumbing be inferred. Years after he wrote those nice, clean books, full of tacit hygiene, Mr. McCutcheon visited Graustark—or the place where Graustark would be if it were anywhere.

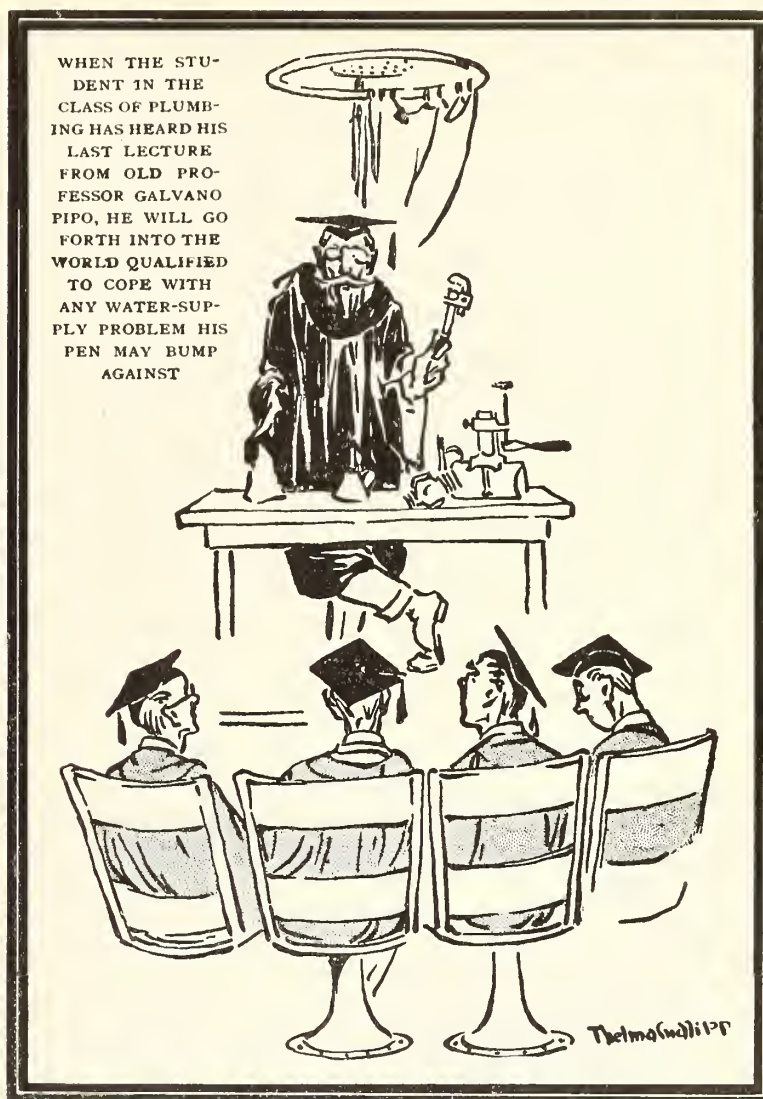
"Will you write another Graustark novel?" he was asked as he hopped off the ship on his return to New York.

"No," he said, and his tone was that of a man who had just lost \$100,000. "I have seen the Balkans and I can never again write sympathetically of any one living in or near that part of the world. Nobody in the Balkans, be he prince, potentate or peasant, ever took a bath in his life."

And there you have the weakness of an author who permits the plumbing of his best works to be inferred, instead of making it practical.

The trend of modern thought has compelled many authors to establish a set of unwritten rules for sanitary romance. For instance, when a hero slinks away from his newly-plumbed residence, which he is abandoning to the convenience of Miss Shirley Shillyshally and her Aunt Prudence, is he himself to go unwashed? No, indeed! It is up to the novelist to discover in the wild region on the other side of the mountain, a wonderful secret waterfall which, due to its volcanic origin, has hot and cold showers, not to mention a natural soap-dish worn in the very rock. Here the hero tubs at his leisure, even after the arrival on Mount Zingo of Martin Maledict, the villain, for it is the law of the novel, hitherto unwritten, that no villain shall open fire on any hero while the hero is stripped to the buff. Neither must the villain steal the hero's clothes or tie knots in his socks. It is perfectly proper for Villainy to drop bichloride of mercury in Heroism's winecup, but Villainy must not even throw a snowball at Heroism until the hero's hair is Harrisonfishered and his Norfolk jacket neatly buttoned.

As for a villain's bath, let him wait. Only a few chapters, and the dark waters of the fiord will close over him forever.



It may be, in the course of the novel, that Martin Maledict persuades Shirley and her chaperon to fly with him on his yacht, which has been anchored in the offing. The hero has such a long swim in catching up to them that you feel he is qualified to do without a bath for a couple of days. At the end of this period the novelist puts a knife between his (Henry Heartache's) teeth, and he goes overboard to kill a shark which is about to eat Shirley's lace fan. The pursuit of a treacherous Kanaka is another fine excuse for bathing a hero.

Some day there will be a College of Novelism with a white-enamelled Chair of Plumbing in it and after that our best sellers will have something of a general heart interest for the house-wife and the commuter. Why should not the struggles of a man digging through four feet of frozen earth to get a glaciated waterpipe be as thrillingly described as the antics of a man delving for mere gold? Rex Beach may answer if he can.

And when the student in the class of

plumbing has heard his last lecture from old Professor Galvano Pipo, he will go forth into the world qualified to cope with any water-supply problem that his pen may bump against. Deftly will his hero carry the kit of plumber's tools into the jungles of the Amazon and the mountains of Mars. Arctic explorers will lay water mains farther north than runs the law of man or city meter. The deserts will have pools and the pools will have springboards, even in the mirages. Castles on the Rhine will lower their drawbridges to admit the jolly barons of Steamfitters' Union No. 456.

Even send a hero to Siberia, and the Czar, in a moment of temporary aberration, (Note to Russian censor: This is a fashionable American disease), will have the fine fellow assigned to Russian bath department of the salt mines.

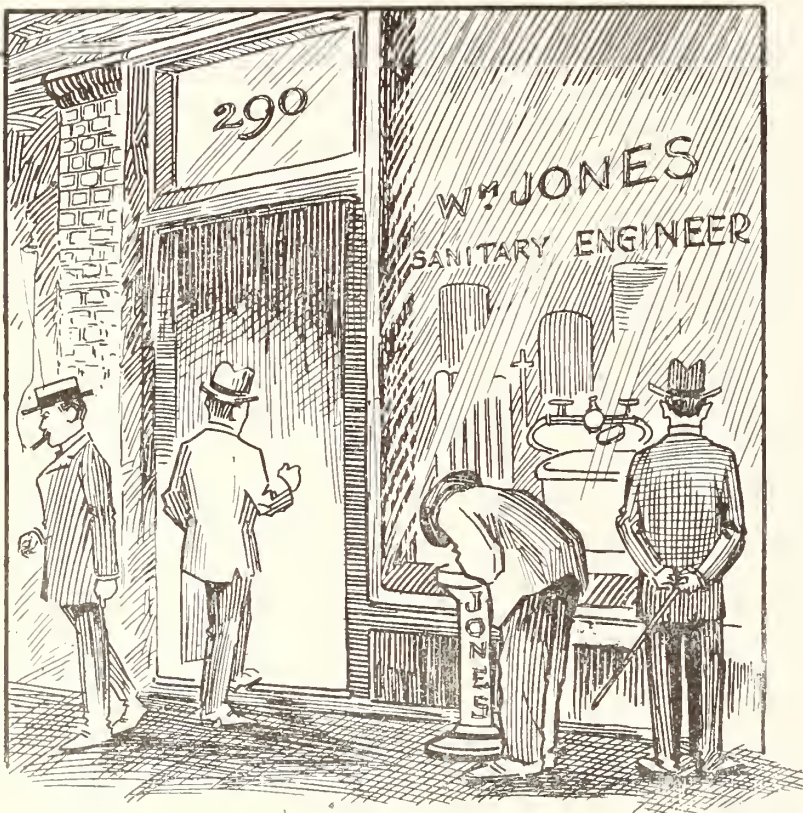
And as for the reviewers, who sit at the end of every novelist's vista, they will not gauge a novel by the clearness of style, but by the brightness of the taps and the general workmanship of the hot-water system.

Sanitary Drinking Fountains A Good Advertisement

Why Sanitary Engineers Should Place One at the Front of Their Store—Boost the Sale of These Fixtures and See They Are Included in the Specifications for Office and Other Large Buildings.

IF there is one fixture more than another which should be boosted it is the sanitary drinking fountain. We read in various newspapers that medical health officers intend to enforce their use in large office buildings, in factories and workshops, hence it is up to the sanitary engineer to stock a few of these fixtures and put them more prominently before the eyes of the public. We would suggest that every sanitary engineer place one at the curb in front of his establishment with a suitable advertisement on it. Such a scheme would be a service to the public and

sanitary fountain will be an attachment to every lavatory and sink, and there will be three holes in the lavatory and sink fixture so as to install a fountain fixture. And why not? The fact of the matter is we do not drink enough water and a drinking fountain placed on the various fixtures would be bound to create the desire to take a drink. The drinking cup is doomed and its end should be hastened by the progressive sanitary engineer, not only by placing a drinking fountain in front of his store, but also by having several styles fitted up in his establishment, so as to de-



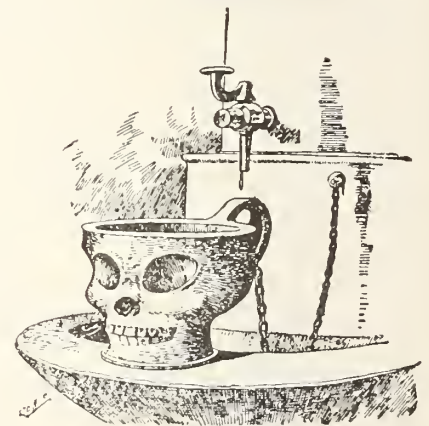
would be sure to bring results. There should also be one or two fitted up inside the establishment. One of the weakest points in the make-up of the sanitary engineer is, that he is a poor salesman and very seldom tries to create a demand for something new. Sanitary drinking fountains are come to stay and no doubt about it. Then why not get in the running for the new business? We feel that in the near future the

monstrate the practicability of this sanitary convenience. During the slack season a sanitary engineer would do well to visit owners of factories and office buildings and do a little canvassing in this line. He might secure an order for one sanitary drinking fountain as a trial, and ask the owner to note how it is appreciated by his employees, and no doubt in a very short time good business would be the result.



DO YOU READ THE TRADE PAPERS?

The majority of dealers read the trade papers—that is, those papers that refer to his lines of business—because he realizes that the time is well spent, as there are always some new ideas



worth having and lots of hints that help him keep up to date and alert to adopt suggestions in reaching out for business.

We sometimes wonder, however, if the boss realizes what a good thing it would be to make sure that his clerks read them as well.—Enterprise News.

Standardization of Cast Iron Soil Pipe and Fittings

Showing That Some Standard of Weights, Sizes and General Design is of Great Importance and Should be Discussed Seriously by Every Member of the Craft Throughout Canada.

By Wm. McFarlane, Assistant Inspector of Sanitary Engineering, Winnipeg.

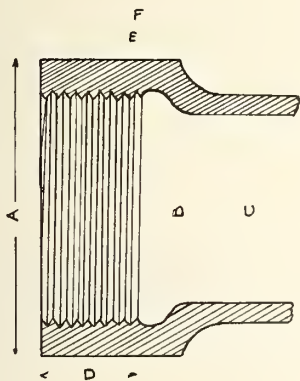


IS there a call for it? I think it will be conceded by not only those present here, but by all connected, directly or indirectly, with the installation of plumbing, that there is a decided call for standardization in the construction of pipe and fittings relative to diameters of

pipes and hubs, radii of bends and offsets and length of spigot end of all fittings.

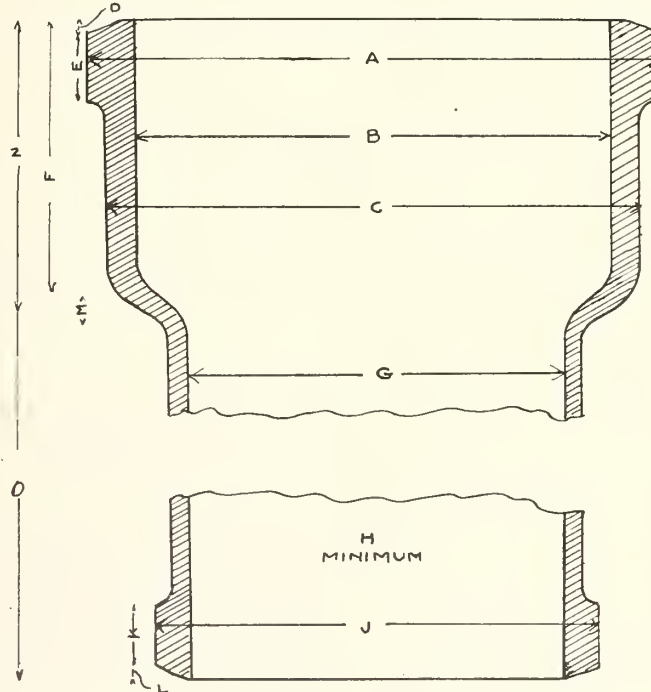
With the idea of gathering some data for the work placed upon us as a committee on standardization, we visited the several wholesale supply houses, taking notes of the different makes of pipe and fittings. In this I must say we were disappointed, as, while each manufac-

turer's own make of pipe and fittings fitted fairly well, we found discrepancies in the sizes of the various makes of pipes which make it difficult to combine one maker's material with another, should the necessity arise, as it has done in the past, through scarcity of fittings and other reasons to do so. Taking 4-inch pipe alone, we found it varying from 1/16 to 1/4 less than 4



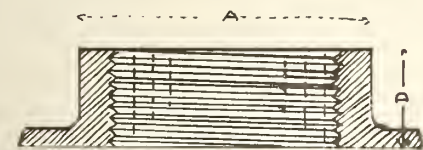
DETAILS FOR TAPPED BOSS FOR WASTE FITTINGS

Size	A.	B.	C.	D.	E.	F.	LENGTH OF TAP
1 1/4"	3 1/8"	2 1/2"	2"	1 1/2"	2"	2 1/4"	2 1/4"
1 1/2"	3 3/8"	2 3/4"	2"	1 1/2"	2"	2 1/2"	2 1/2"
2"	3 1/2"	2 1/2"	2"	1 1/2"	2"	2 1/2"	2 1/2"



DETAILS OF CAST IRON PIPE AND FITTINGS

SIZE OF PIPE	A.	B.	C.	D.	E.	F.	G.	H.	MIN. WALL	J.	K.	L.	M.	N.	O.
MEDIUM															
2"	4 1/16"	3 1/8"	3 1/16"	1 1/8"	1 1/8"	2 1/8"	2"	2 3/8"	5/16"	2 3/4"	3 1/16"	1 1/8"	3/8"	2 1/2"	60"
3"	5 1/16"	4 1/8"	4 1/16"	1 1/8"	1 1/8"	2 5/8"	3"	3 3/8"	3/8"	3 3/4"	5 1/16"	1 1/8"	3/8"	2 3/4"	60"
4"	6 1/16"	5 1/8"	5 1/16"	1 1/8"	1 1/8"	2 7/8"	4"	4 3/8"	3/4"	4 3/4"	6 1/16"	1 1/8"	3/8"	3"	60"
EXTRA HEAVY															
5"	7 1/16"	6 1/8"	6 1/16"	1 1/8"	1 1/8"	2 7/8"	5"	5 3/8"	3/4"	5 3/4"	7 1/16"	1 1/8"	3/8"	3"	60"
6"	8 1/16"	7 1/8"	7 1/16"	1 1/8"	1 1/8"	3"	6"	6 3/8"	3/4"	6 3/4"	8 1/16"	1 1/8"	3/8"	3"	60"
8"	10 1/16"	9 1/8"	9 1/16"	1 1/8"	1 1/8"	3 1/2"	8"	8 3/8"	5/8"	9"	10 1/16"	1 1/8"	3/8"	3 1/2"	60"
10"	12 1/16"	11 1/8"	11 1/16"	1 1/8"	1 1/8"	3 1/2"	10"	10 3/8"	5/8"	11"	12 1/16"	1 1/8"	3/8"	3 1/2"	60"



DETAILS FOR TAPPED BOSS FOR VENT FITTINGS

Size	A.	D.	LENGTH OF TAP
1 1/4"	3 1/8"	1"	3/4"
1 1/2"	3 3/8"	1"	7/8"
2"	3 1/2"	1"	1"

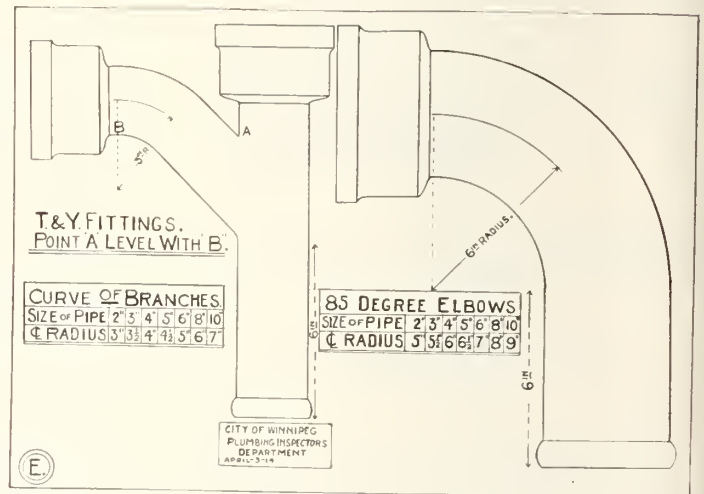
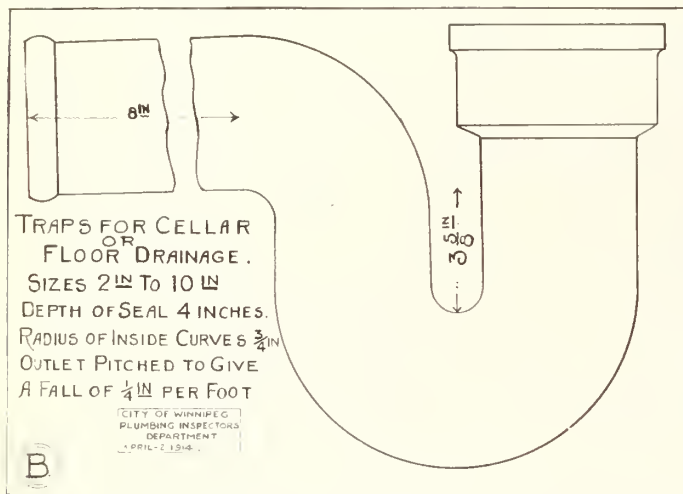
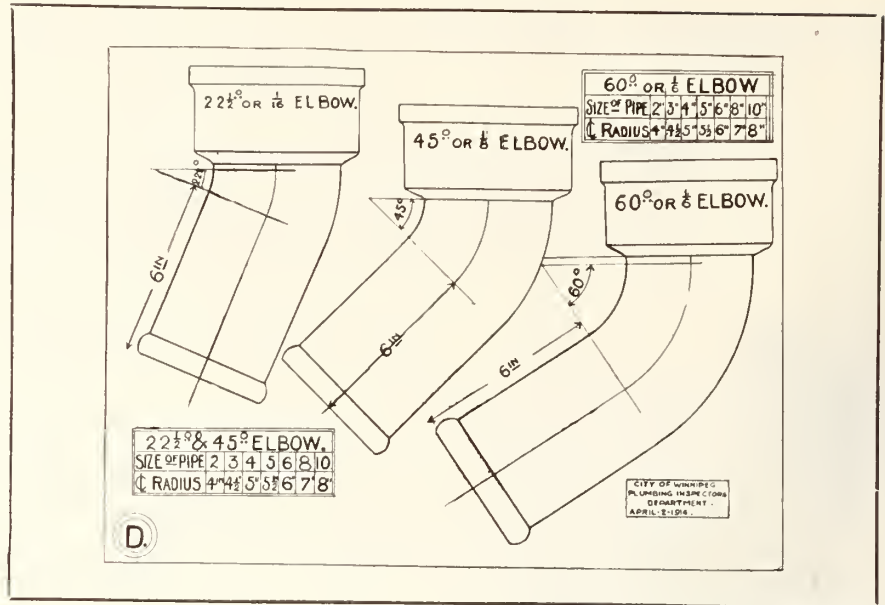
CITY OF WINNIPEG
PLUMBING INSPECTORS
DEPARTMENT.
APRIL - 2 - 1914 -

inches in diameter; in fact, at the time our visits were made there was only one pipe in all we measured which was up to size.

With regard to fittings, we found a number where the body of the bend or branch was of medium weight, while the hub was of standard weight. In another instance we found on comparing two T.Y. branches one marked "X.H." and the other marked "Med." The medium seemed the heavier of the two, and when placing the "Med." into the hub of the "X.H." we had a tighter joint than when we reversed them.

Finding no assistance under these conditions, we decided to work out our own sizes, and in this connection we are indebted to the valuable assistance derived from a paper delivered by R. R. Rust to the American Society of Plumbing Inspectors at their convention in Milwaukee, 1911.

When discussing the subject, there



were several leading points we decided upon, viz.:—

1st.—A uniform lead space in all joints.

2nd.—A sufficient thickness of wall in hubs to resist caulking strain.

3rd.—T.Y. branches as far as possible

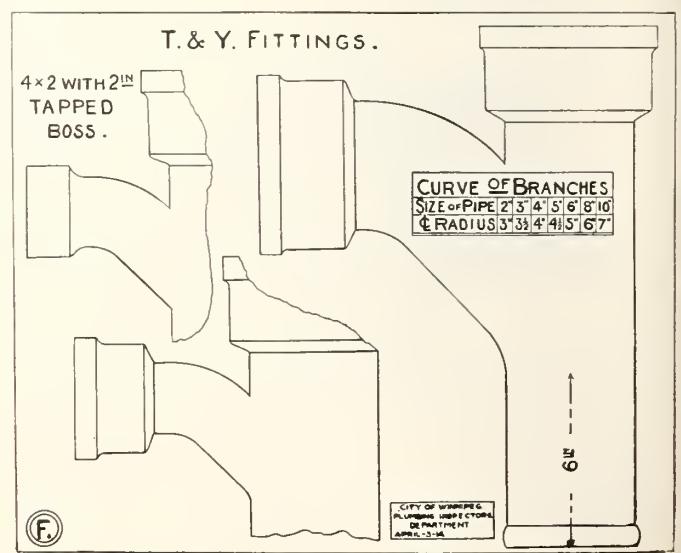
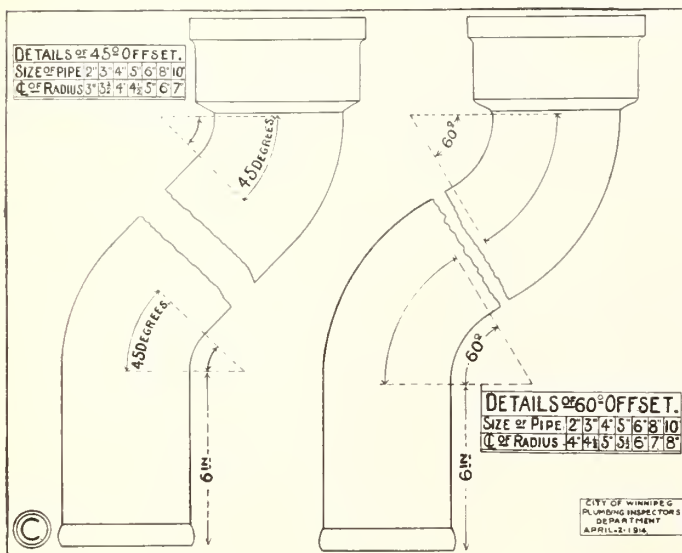
to be on the T. and Y. principle, especially those 2 in. and less in diameter.

4th.—All bends and offsets to have an easy radius.

5th.—All fittings to have sufficient length at spigot end to allow the joint being properly caulked, a point which is

very essential when you consider that the bulk of the leakages found on inspection arise from the fact of this part of the fitting being too short, thereby making it difficult to caulk the joint properly in the throat of the fitting.

(Continued on page 23.)



GOSSIP OF THE TRADE

UNIFORM PLUMBING

BY-LAW FOR CANADA

Regina Asked to Send Representative

The adoption of a uniform plumbing by-law in all the cities of Canada is the slogan of the Canadian Institute of Sanitary Engineers, according to a letter received recently by the city council from the secretary, William McFarlane, of Winnipeg.

The letter, which was read at a meeting of the aldermen invited the city to send a representative to the annual convention which is being held in Edmonton on May 4, 5, and 6 of this year. The business of the convention will be particularly directed towards completing the work started at last year's convention in Winnipeg. "The adoption of a uniform plumbing by-law will mean a saving of time, money and energy to everybody interested, from the manufacturer to the citizen, to say nothing of the beneficent influence in the conservation of health which such a measure would exert," says Mr. McFarlane.

The letter will be dealt with at the next meeting of the committee of health and public safety.

FIRE LOSS IN HAMILTON.

A fire occurred recently at the plumbing shop of Robert Fitzsimmons, in the rear of 13½ East Main street. One of the men was gleaming a gasoline torch, which in some way became ignited and started a small blaze. The damage was slight.

FIRE LOSS.

The Canadian Wolverine Co., Ltd., Chatham, who manufacture high-grade brass goods, suffered a loss by fire on Friday, April 10. We are, however, officially informed that all orders will be taken care of by their plant in Grand Rapids until such times as their Chatham plant is under way again.

DEATH CALLS ONE OF CRANE CO.'S REPRESENTATIVES.

Mr. Harry Munroe, aged 29, a well known young business man of Vancouver, lately a traveler with Crane & Co.,

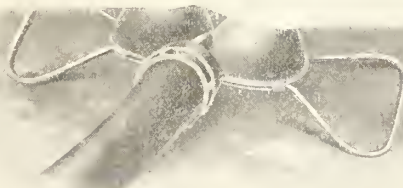
died recently at the home of his parents in Bellingham. He had a large circle of friends in Vancouver.

WINNIPEG PLANT IN FULL SWING.

Mr. L. Anthes, of the Anthes Foundry Co., Ltd., who for several weeks was in Toronto, has now returned to Winnipeg. Their foundry in the latter city is now in full swing, turning out soil pipe and fittings.

JEWEL DUPLEX SPRINKLER.

The Jewel-Duplex brass sprinkler here illustrated is being offered to the Canadian trade by Henderson & Richardson, Montreal. The sprinkler is made of brass and is claimed to give a low down, cactus-like spray, 20 feet in diameter. It is said to be economical in the use of



No. 3—Jewel Duplex Sprinkler.

water and not affected by wind. The pressure of water causes it to hug the ground.

ESTIMATE SHEET.

The James Robertson Co., Ltd., Toronto, are sending out an estimate sheet, which we are here reproducing in quarter size.

F. S. Lamson, manager of the Ash-down Hardware Co.'s heating and plumbing department, has returned from a business trip South.

STANDARDIZATION OF SOIL PIPE.

(Continued from page 22.)

Regarding Durham or recessed fittings for wrought iron pipe, we deprecate the use of the short branches and quick bends much in vogue at present, and advocate the use of long sweep bends and T. and Y. branches.

As to bends at foot of stacks, we recommend the use of a long sweep bend, with long sweep branch, finishing with a hub, which, if necessary, can be extended to floor level with a short piece of pipe, a cleanout being caulked into pipe at floor level. This bend, if thought necessary, may have a heel rest cast on same for the purpose of supporting the stack.

In preparing our tables we decided to deal only with diameters, radii of bends and length of pipes and fittings, leaving weight to take care of itself, as we considered that weight was something that could be added or removed at the maker's discretion to make it conform to the standard, and not always to the advantage of the fitting.

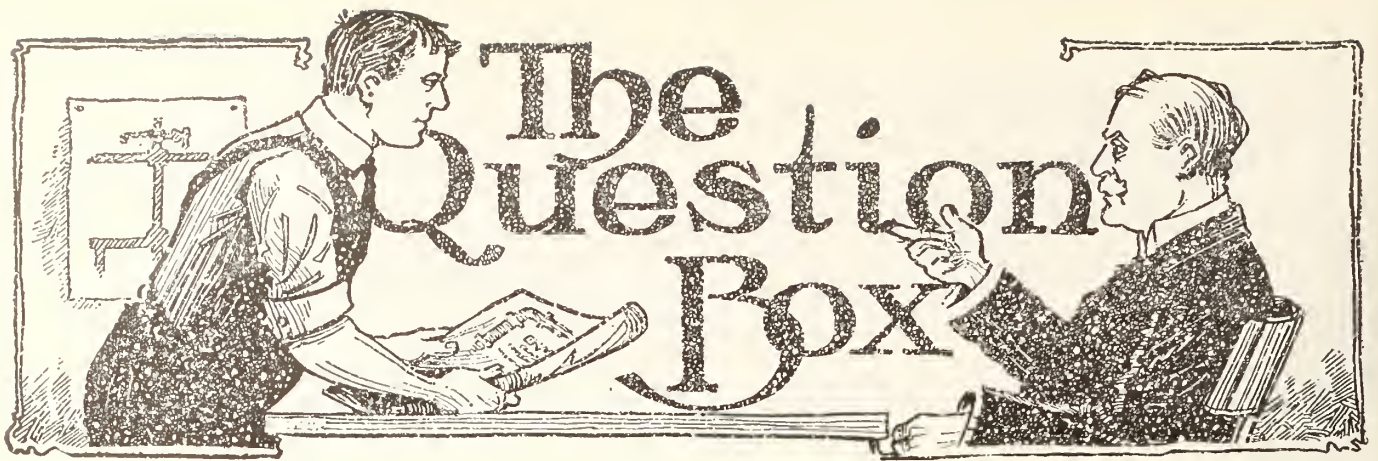
We have prepared a number of drawings embodying all the foregoing points, and which we now submit for your approval.

As a specification for cast iron pipe we beg to submit the following:—

All pipes and fittings must be true to drawing, sound, free from cracks, sand soles, blow holes and cold shuts. No filling with metal, cement or other material or burning on of iron to be permitted; to be of uniform wall thickness, showing no greater variation at any point than 1/32 in. in "X.H." pipe and 1/64 in. in "Med." pipe, and at hub and spigot ends to present a true circle. The bore of all pipes and fittings to be smooth and free from fins, ridges and adhering sand. The iron used in their construction to be of such a quality as will admit of easy cutting with file or chisel.

All pipes and fittings to have the manufacturer's name or trade mark, and whether "Med." pipe or "X.H." clearly stamped on hub thereof.

The drawings on page 21 show more clearly the details of piping.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

REMOVE RUST MARKS OF CAST IRON ENAMELWARE.

Editor, Sanitary Engineer.—Please inform me in your next issue of Sanitary Engineer, what is the best preparation for removing rust stains from cast iron enamelware such as is caused by a leaking faucet? C. W.

Replying to C. W., we may state we do not know of any particular preparation, but the writer has used with good results a little pure muriatic acid applied with a swab. "Not killed acid."—Editor.

SEPTIC TANK IN USE 18 YEARS.

Editor Sanitary Engineer.—I have noticed quite a few types of septic tanks in Sanitary Engineer from time to time, and, therefore, send you one more that I have used for years, and they have given no trouble as yet, and some which I have installed have been in use for eighteen years. What is your opinion of it? Should the surface scum be protected?

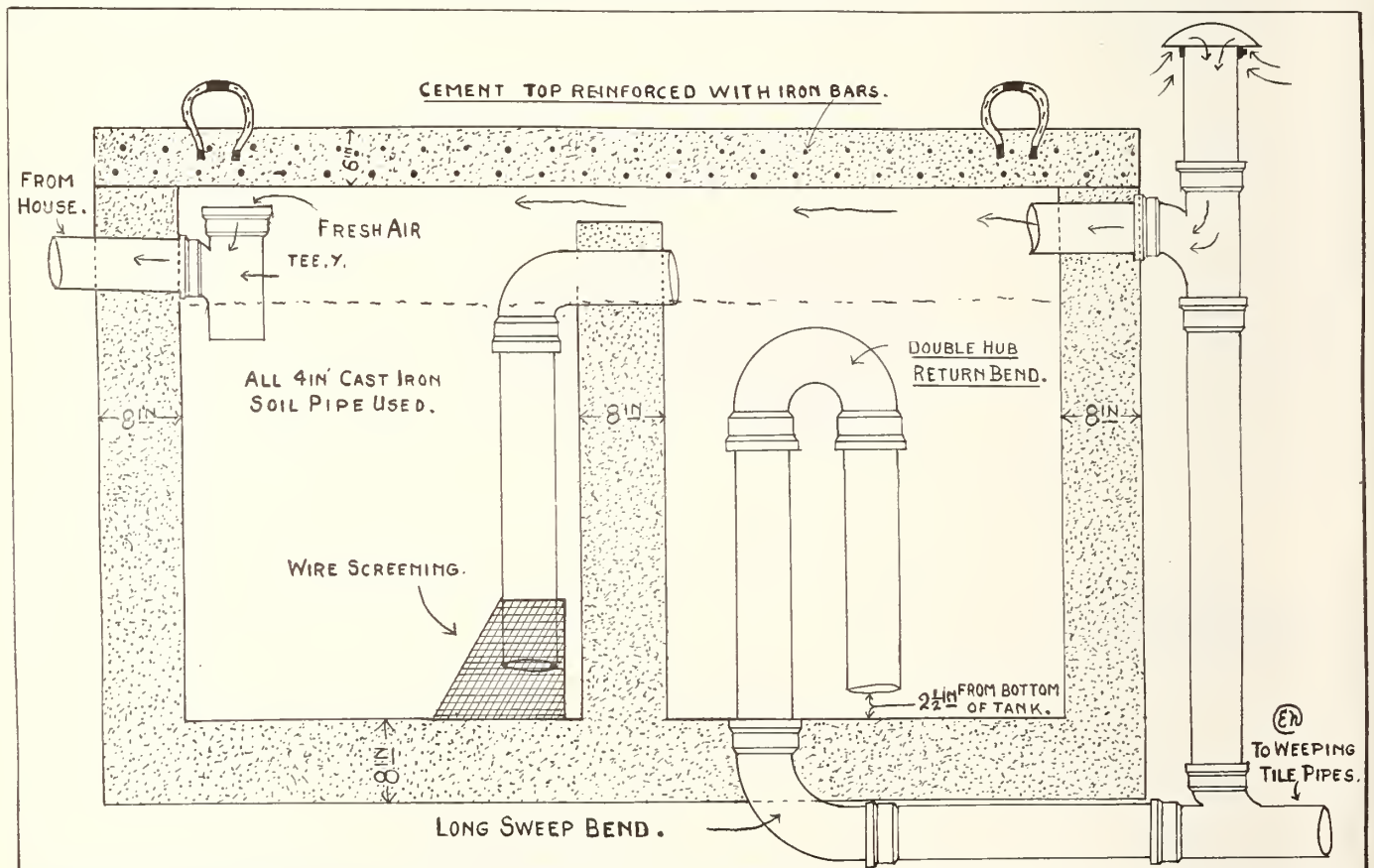
Orangeville, Ont.

C. F. G.

We have reproduced sketch of septic tank, Fig. 1, which was submitted by

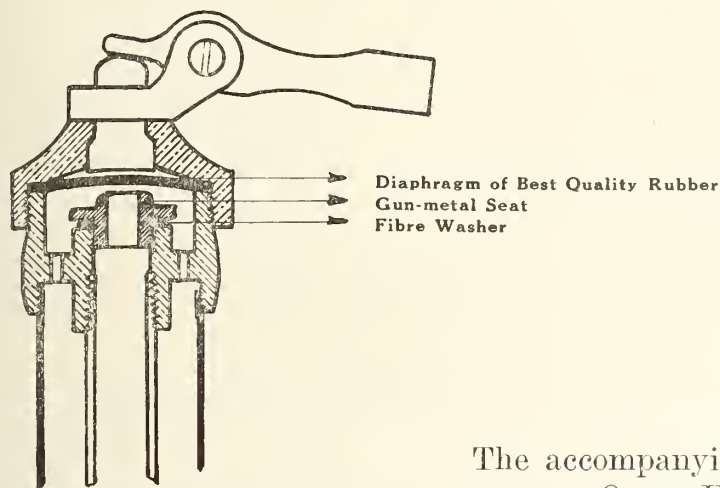
C. F. G., and may state that we see nothing wrong with its construction; and the fact that our correspondent has been installing the same type for several years speaks for itself. Referring to the question as to whether the surface scum should be protected, we do not think it is necessary when the tank is made of sufficient depth and size. The method adopted by our correspondent of placing a tee on the outlet from the house fixtures is not absolutely necessary.—Editor.

(Continued on page 26.)

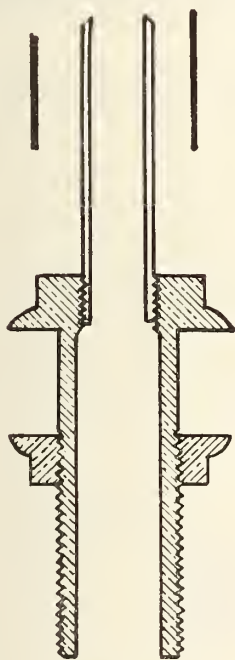


Sketch of septic tank sent in by C. F. G. The Tee Y. on soil pipe from house was placed in such a position so as to prevent the scum being disturbed. The horse shoes were cast in the cement top to lift the cover off with the aid of crow bars.

EMPIRE QUEEN BALL-COCK



Diaphragm of Best Quality Rubber
Gun-metal Seat
Fibre Washer



Patents Pending

The accompanying cut shows a section of our new Queen High-Up Ball Cock. Simple in construction, yet the **Best** ball cock on the market.

Impossible for water to get past the diaphragm and out the plunger.

Seat made of special gun-metal impervious to alkali waters.

Diaphragm of best quality rubber—will last a life-time. All working parts easily accessible without removing ball cock from tank. Tested under hydraulic pressure as in actual working conditions.

Can Be Made for High Pressure

EMPIRE MANUFACTURING CO., LIMITED
LONDON, CANADA

MANUFACTURERS OF AND DEALERS IN
PLUMBERS' AND STEAMFITTERS' SUPPLIES OF ALL KINDS

Market Reports

TORONTO.

April is holding her own as far as the sanitary and heating business is concerned. Some shops are very busy, though they are not employing their full staff. They are busier than last year, while others are just as quiet; but, taking everything into consideration, April is April, and the outlook is fairly good, though it is felt that the season will be prolonged somewhat this year on account of there being so few buildings under construction during the past winter, and those already started and to start will be late before they are ready for the installing of the plumbing and heating. The trade as a whole are optimistic, both contractors, jobbers and manufacturers.

No Price Changes.

There has been no changes in prices since our last issue, and, with the exception of lead goods and solder, the latter being governed by the tin market, prices are fairly well established.

More Demands for Solid Porcelain.

We are told that demands for solid porcelain are larger than ever—baths, lavatories and urinals—which goes to prove that the public are going in for goods of a higher and more expensive class.

WINNIPEG.

April 12.—It is still a little early to say what business in the plumbing and steamfitting lines will be like this year. At this date the building permits issued here have considerably exceeded \$3,000,000, and plans are being drawn for a number of large buildings; so that it will not be long before the four-million-dollar mark is passed. This is ahead of last year.

These figures have been given considerable publicity by the Winnipeg newspapers in an effort to show that business in this part of the country is brisk. If such figures could be taken at their face value, the last men in the world who would have any reason to kick would be the steamfitters and plumbers. They are just the people, however, who deprecate the publication of these figures under such big headlines by the newspapers. Their claim is that the only purpose it will serve will be to bring a lot of laborers into the city, who will require to be fed.

Men prominent in the plumbing business declare that not 10 per cent. of the buildings for which permits have been issued by the city will be erected this year. A big proportion of this sum is for apartment blocks. Why, asked Sanitary Engineer of one, are these buildings planned if there is no intention of going ahead with construction? He replied that architects were employed to make preliminary sketches for investors, a permit secured, and there the scheme stood for want of money. Sanitary Engineer's informant further stated that he had many friends who were not building this year, although they had the money, because they did not think conditions warranted it.

Inquiry among the supply houses elicited the fact that the demand this year so far was considerably below that of last year. Enamelware is selling in proportion to the amount of building going on, which is small. It is moving slowly, and in small and scattered quantities. Brass goods are about the same. The supplies being carried are about normal, and enough for the demand. There is considerable cutting of prices when tendering for work, with the result that jobs are being more evenly distributed. Most plumbers seem to have enough work to keep them going.

QUESTION BOX.

(Continued from page 24.)

EXPANSION TANKS AGAIN.

Editor Sanitary Engineer.—In your last issue you gave two sketches of expansion tanks. Would you please show in your next issue how Fig. 1 would be connected to the system, and also show how it could be connected with a radiator on the top floor a little below the expansion tank?

Another Inquirer.

In answer to "Another Inquirer," we are submitting another sketch, Fig. 2, giving the information required. We would be very pleased to receive sketches of some of the methods adopted. The writer saw a strange connection the other day which had a 1/2-inch iron pipe for supply with a globe valve; then about 2 feet of 1-inch pipe was attached to the 1/2-inch pipe, with a 1/2 x 1-in. reducing coupling and a 1-inch cap. Whatever possessed the fitter to place an air chamber in such a position is one too many for the writer, who would like to know if any of our readers could explain.—Editor.

Some men are like the little boy who disliked his teacher because "she didn't teach him nothin' he didn't know."

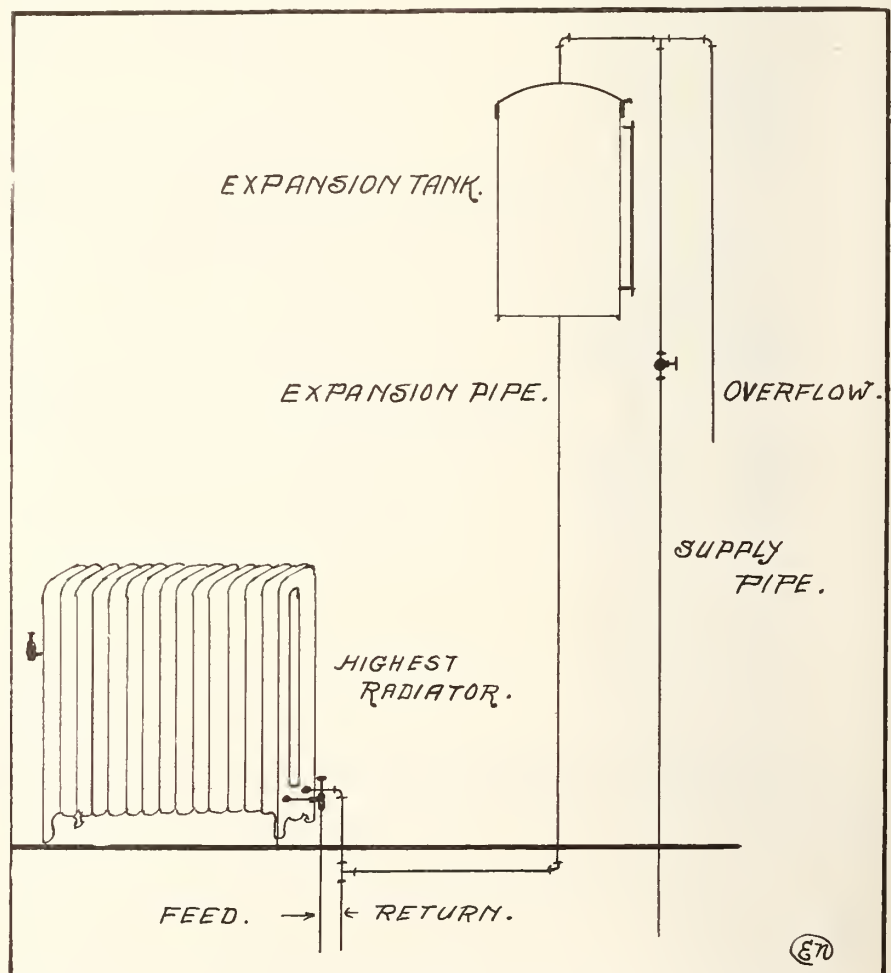
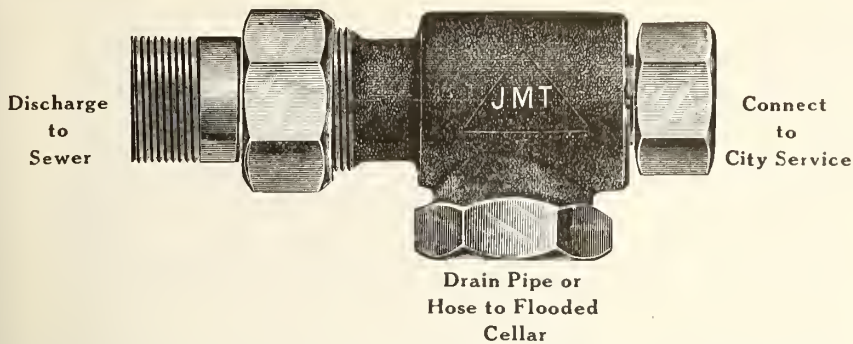


Fig. 2.



THAT FLOODED CELLAR

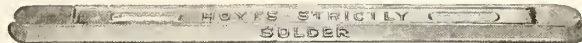
THE Morrison Water Jet Lifter is the simplest, cheapest, and yet effective, piece of apparatus known for disposing of an accumulation of water. It is designed to be self-priming and to automatically continue to pump water from basements, excavations, pits, etc. without any attention whatever after it is put in operation. It is operated by water from the city mains, and is made of solid brass and without moving parts. It can't get out of order. It will lift water any height up to 30 feet; will operate in any position, at any city pressure; will pump hot or cold, clear or muddy water. **SAVES ITS PRICE IN ONE DAY'S WORK.**

The uses to which the Morrison Water Jet Lifter can be applied are numerous, such as emptying Flooded Cellars caused by the backing up of sewers, due to heavy rain storms, flooded excavations in building operation, and every accumulation of water of a kindred nature.

The Water Jet Lifter can be operated wherever there is a water supply; for instance, in the case where a cellar in a house has become flooded, all one has to do is to connect the Lifter by means of a hose to faucet in Laundry or Kitchen sink, and upon opening Tap, the Lifter is at work. The discharge can be carried off down through Sink or Laundry Tub Waste, or through an open window, as may be desired.

THE JAMES MORRISON BRASS MFG. CO., Limited
93-97 Adelaide St. W. Toronto, Canada

Our Mixed Metal Sales Amount to Over \$5,000,000 Annually



THE RESULT OF QUALITY

Babbitt Metal, Bar Solder, Wire Solder, Lead Pipe, Bar Lead, Traps, Bends, Copper, Tin and Antimony.

Let the goods prove their worthiness of a place in your stock. Send a trial order.

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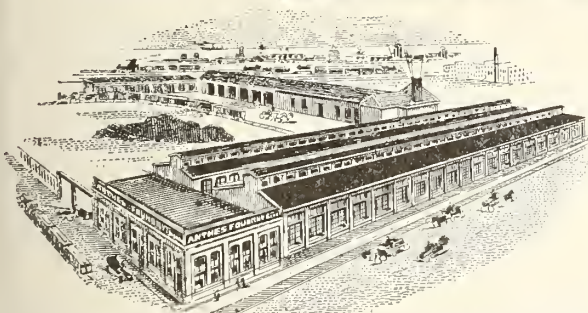
Toronto, Ont.

New York, N. Y.; London, Eng.; St. Louis, Mo.

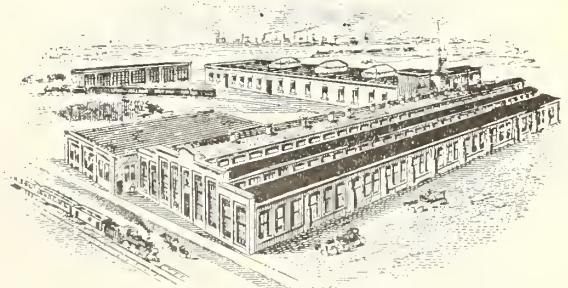
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TORONTO

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OF
**CAST IRON
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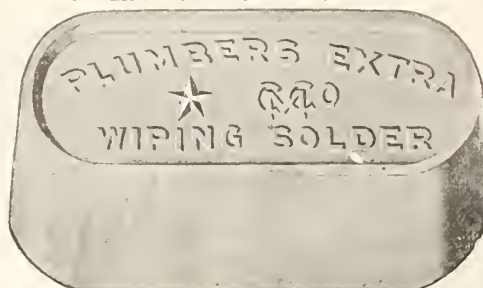
WE MANUFACTURE FOR THE PLUMBER

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Trap (Ask for Cut or Price).
Strictly Bar Solder
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Earth)
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Acme Wiping
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Iron and Lead Combination
Ferrule Bends or Spun End Test
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THE SOLDER WITH THE TIN IN

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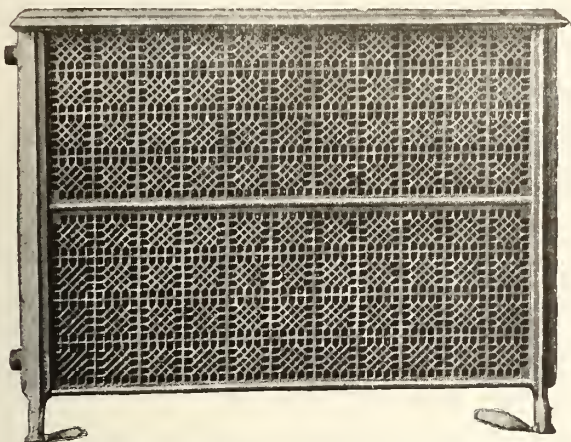
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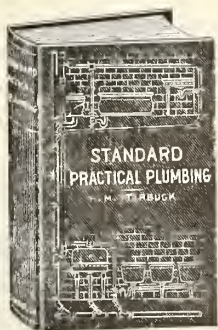
The Latest Achievement in
Hot Water Heating



1/3 Weight, 2/3 Size, 1/10 of Water necessary
as compared with cast iron radiators.

WRITE FOR BOOKLET.

Vici Radiator Co.
HAMILTON, ONT.



A WANTABLE BOOK

Standard Practical Plumbing

By R. M. Starbuck

347 SPECIALLY MADE ILLUSTRATIONS

PRICE \$3.00

"Standard Practical Plumbing" is indispensable to the Master Plumber, the Journeyman Plumber, and the Apprentice Plumber. As the book is specially strong in the exhaustive treatment of the skilled work of the plumber, it commends itself at once to every one working in any branch of the plumbing trade. Send for it to-day.

TECHNICAL BOOK DEPARTMENT

MACLEAN PUBLISHING COMPANY
143-149 UNIVERSITY AVENUE - TORONTO

DUNHAM SYSTEMS

The Pride of the Owner: The Friend of Exacting Contractor and Architect: and the best helper the Operating Engineer has.

Pride of the Owner because:—It satisfies, it saves fuel and fulfills the claims made of it.

Friend of the Exacting Contractor because:—Quality satisfies, no complaints or delays in securing settlements on the job when done, and no necessity of sending an expensive man back on the job time and again to "eat up" the profits. They are really, truly, profits.

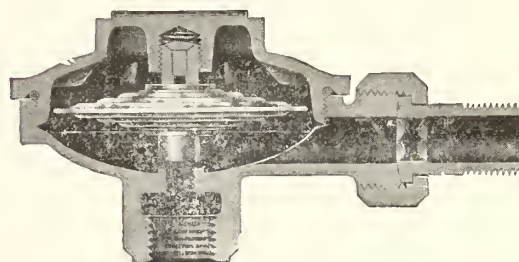
Best Helper of the Operating Engineer because:—His Dunham System requires no attention for adjustments. His time is his own, so far as the Heating System affects it.

There are many unsatisfactory heating systems that may be the means of your making warm friends with a new client.

HOW?—By supplying them with a Dunham Radiator Trap for trial and proving that it eliminates their trouble.

Write for more particulars on your trouble jobs.

THE DUNHAM RADIATOR TRAP



Performs the functions of a Radiator Steam Trap, perfectly and continuously. Eliminates water and air without loss of steam.

OUR NEW BULLETIN CATALOG NOW
READY AND "VERY INTERESTING"

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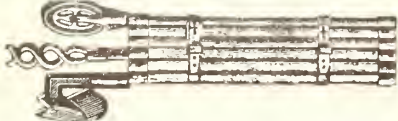
Education an Investment

If you want to secure a sound investment for a few dollars, STUDY SANITARY ENGINEERING or PLUMBING, under the directorship of Prof. Arthur Bateman, who has been a practical teacher for eleven years, in four different institutions, in two countries. Booklet free. Write Desk 5.

ANGLO-AMERICAN SANITARY CORRESPONDENCE COLLEGE

10-12 W. Ontario Street, Chicago, Ill.

DRAIN-CLEANING MACHINE



Fitted with Double Worm Screw, Rubber Plunge, Jointed Scraper, and 4-inch Bass Brush. Prices on application.

H. EATON, 2249 Yonge St., N. Toronto, Ont.



GENUINE ARMSTRONG STOCKS and DIES

FOR THREADING PIPE OR BOLTS

KNOWN, USED, COMMENDED EVERYWHERE

PIPE MACHINES,
both Hand or Power

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BARD ADJUSTABLE
BUSHINGS

Manufactured by

THE ARMSTRONG M'F'G. CO.

317 Knowlton St.

BRIDGEPORT, CONN., U.S.A.
NEW YORK CHICAGO

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Condensed or "Want" Ads.

FOR SALE

FIRST-CLASS PLUMBING AND PUMP business in a town about 2,000, doing a good trade, water works just installed last summer and a good business is being done. An A1 business for a first-class plumber, stock about \$800.00. Good reasons for selling. Address Box 73, Fergus, Ont. (9)

FIRST-CLASS PLUMBING AND PUMP business in a town about 2,000, doing a good trade, water works just installed last summer and a good business is being done. An A1 business for a first-class plumber, stock about \$800.00. Good reasons for selling. Address Box 73, Fergus, Ont. (4tf)

PLUMBING — THIS IS A WELL-ESTABLISHED business in a very good location. Fine opportunity for a practical plumber. Will sell very reasonable, as have other interests. If you are looking for a location and a bargain write and will send you full particulars. Charles Geiser, Saskatoon, Sask. (7)

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PLUMBER & STEAMFITTER—SPLENDID chance for ambitious man with about \$500.00 cash or security. Well-established business, just outside Toronto. Good reasons for selling. Apply 118 King Street East, upstairs. (6)

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DOMESTIC ELECTRICAL WORK BY William A. Wittbecker. Concise and Practical Explanation for Sanitary Engineers on How to Wire Buildings for Bells, Alarms, Annunciators, and for Gas Lighting from Batteries. The information given is practical, and with a close observance of the directions laid down, any one, though entirely ignorant of electricity, should be able to do the work described. Illustrated with 22 diagrams. Price, in paper, 25c postpaid. Price, in cloth, 50c. MacLean Pub. Co., 143 University Avenue, Toronto.

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SYPHONS FOR SEPTIC TANKS

Alex. I. Mearns
93 St. Genevieve Street, Montreal

Keep in mind the dominant fact that mankind from its first appearance on the earth has been schooled by nature to look for signs; for invitations to taste; for suggestions as to what to wear. Tell your story briefly, forcibly, truthfully, and address it through the proper media and you can successfully apply advertising as a means to increased distribution.

"Agrippa"

Chain Wrenches



Universal for Pipe and Fittings

A life may depend upon or an injury may result from the use of most tools. "AGRIPPA" Chain Pipe Wrenches are tested and proved dependable before they reach you. This practice is unknown elsewhere—every weakness is eliminated.

"AGRIPPA" Wrenches will do all of your pipe and fittings work and are guaranteed to do it without a failure—and at the minimum of cost.



Show us a plug which a Williams Waste Plug Spanner will not fit.

J.H. Williams & Co.

Superior Drop-forged Tools

77 Richards St., Brooklyn, N.Y. City
40 So. Clinton St., Chicago, Ill.



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Galt Brass Co., Galt.

Canadian Brass Co., Galt.
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James Morrison Brass Mfg. Co., Toronto.
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Canadian Johns-Manville Co., Ltd., Toronto.

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Canadian Tube & Iron Co., Ltd., Montreal.

Steel & Radiation, Ltd., Toronto.
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National Steam Specialty Co., Chicago.

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C. A. Dunham & Co., Ltd., Toronto.

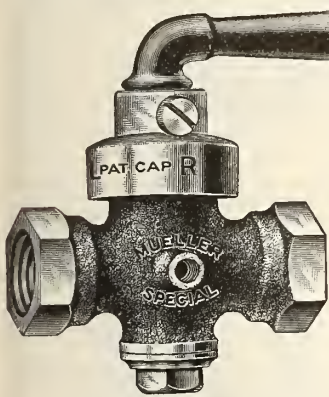
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Kerr Engine Co., Walkerville, Ont.
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You will be pleased and your customer will be satisfied with Mueller Ground Key Stop and Waste Cocks.

Recognized everywhere as the acme of perfection in ground key work. You will like to work with these cocks. Your customer will have no cause to complain of them.

If you have never used Mueller ground key cocks place an order now.

These cocks are made in stops and wastes. They are tested under 200 pounds hydraulic pressure — and are Unconditionally Guaranteed. Made in Canada.

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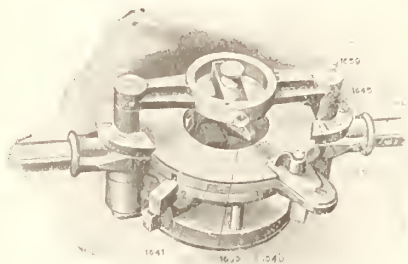
Give full information and prices.

Signed

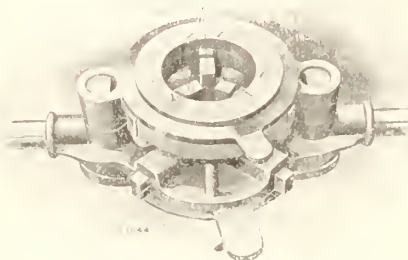
City

Province

Use your Strength—don't waste it!



Die-Stock Open



Rear View of Die-Stock

Because you happen to be pretty strong, because Nature happens to have endowed you with a good store of vim—is no reason at all for wasting it. You know, full well, that you need all your strength to fight the battle of Life with—yet, perhaps, knowing this, you are deliberately wasting 75% of your strength by not using the

Premier Die-Stock

That old-fashioned die-stock of yours is an energy absorber, and being inefficient, it does not return to you, in good threads, even 25% of the strength you used on it.

The "Premier" is an energy absorber too, but it takes less than 25% of the energy that the old stock takes, and cuts a much better thread. The "Premier" has no loose parts, no lead screw.

No. 1 cuts $\frac{1}{2}$ in. to $1\frac{1}{4}$ in. right hand; left hand dies extra.

No. 2 cuts 1 in. to 2 in. right and left hand with the same dies.

Go and interview it at your dealers.

Borden-Canadian Company
66 Richmond St. East
TORONTO, ONT.

JENKINS BROS.'

Type "K" Brass Gate Valves

Never known to fail in service when used under the conditions for which they are designed and sold.

If you have never used them, just give them a trial—after this you will be convinced of their superiority.

Our Diamond trade-mark guarantees every "Genuine" valve against defects in material and workmanship and, furthermore, every valve is thoroughly tested and inspected before leaving the works.

Ask to see them at your dealers.

JENKINS BROS. LIMITED

103 St. Remi St.

Montreal

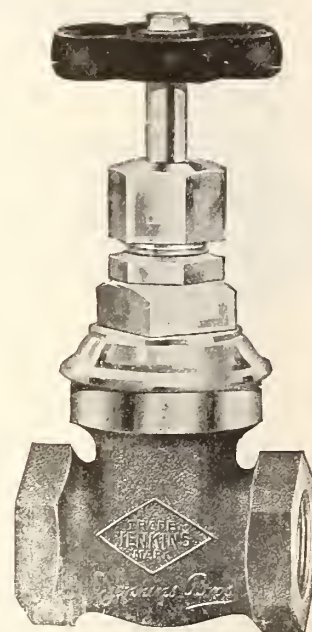


FIG. 300

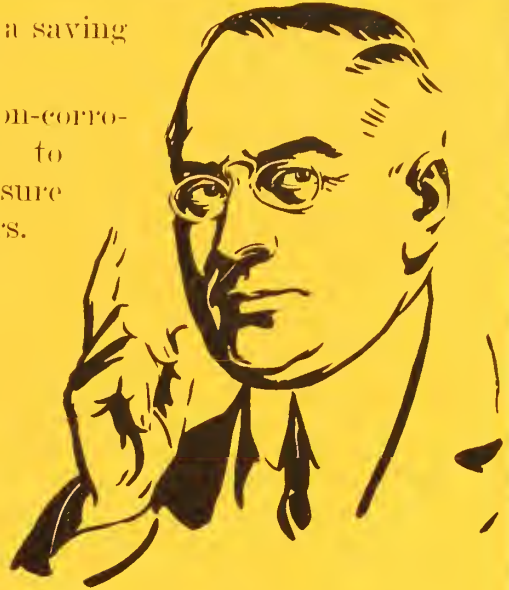
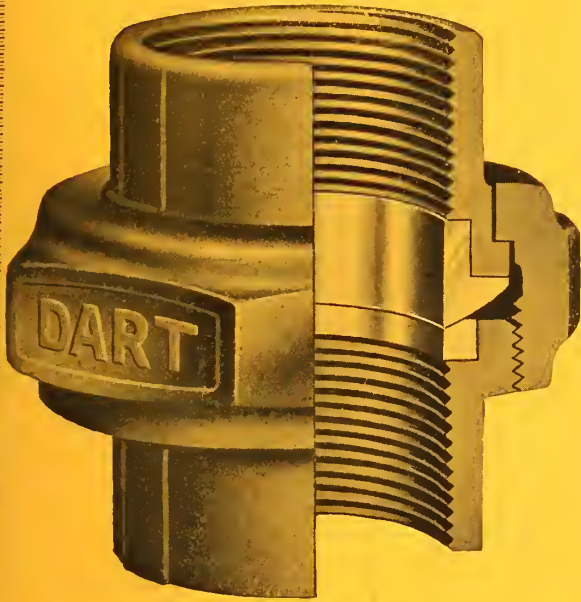
Fully described in
our catalogue.

Write for a copy.
It's free.

"DART" UNIONS

Make pipe connections at a saving of time and labor.

—and because of their non-corrosive, leakless BRONZE to BRONZE Joint they insure satisfied customers.



All DART Unions have the trade-mark as shown on the cut. We will promptly replace 2 for 1 any Dart Union that is found defective.

Manufactured by Dart Union Co., Ltd., Toronto.
Sold by Jobbers Everywhere.

K E R R (New "KEYSTONE" Pattern) GATE VALVES



If you have not used any of these New Pattern Valves, specify "KERR" in your next order. We want you to get acquainted with the most reliable valve on the market.



If you have been using them, we are confident that our satisfaction will bring us your repeat orders. These valves will never cause you or your customer the slightest trouble. Their high quality is consistent.



When you buy a "KERR" Valve you get a guaranteed article that is backed by a reliable firm. Many of the largest distributors of valves in Canada have sold "KERR" Valves for over 25 years, and are still recommending them as the "Best Valve."

Write us for particulars.

Kerr Engine Co., Ltd.,

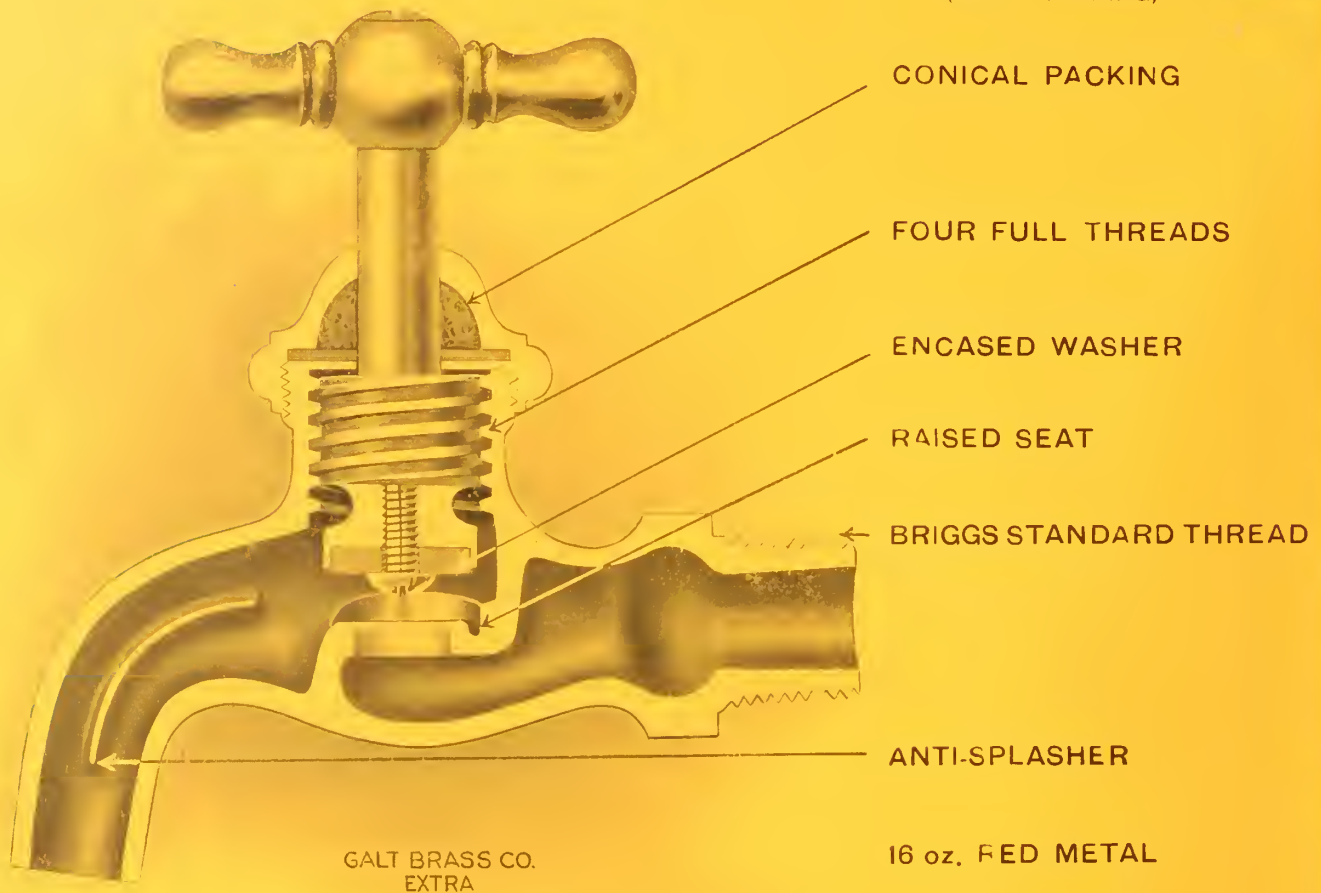
Valve Specialists

Walkerville, Ont.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

"RAPIDO"

(RAPID OPENING)



The above illustration shows, in actual size, the exact construction of all our Bibbs.

The same features are also embodied in all our Bath, Basin and Sink Cocks.

TESTED AND
GUARANTEED

Any article of our make proving defective through inferior metal, or improper workmanship, on our part, will be replaced with TWO good ones, at NO CHARGE to you.

TRADE MARK
GALT BRASS

GALT BRASS CO., Limited
GALT, CANADA

THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

Publication Office : TORONTO, MAY 1, 1914

No. 9

ENAMELED
ALL-OVER

Victor BATH
ONE-PIECE

ENAMELED
INSIDE



The principle of the Victor Bath is a tub body cast integral with a Base and Wing Plates; the latter in various positions on the Tub Body to make the various Combinations, viz.:



Open Type
Corner Type
Recess Type
End to Wall Type
Back to Wall Type
Also with Extension
Rim at End or Back
for fittings—thru Rim

Catalogue and Prices on Request.

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

TORONTO
119 King St. East

MONTREAL
42-44 Beaver Hall Hill

WINNIPEG
76-82 Lombard St.

VANCOUVER
410 Carter Cotton Bldg.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

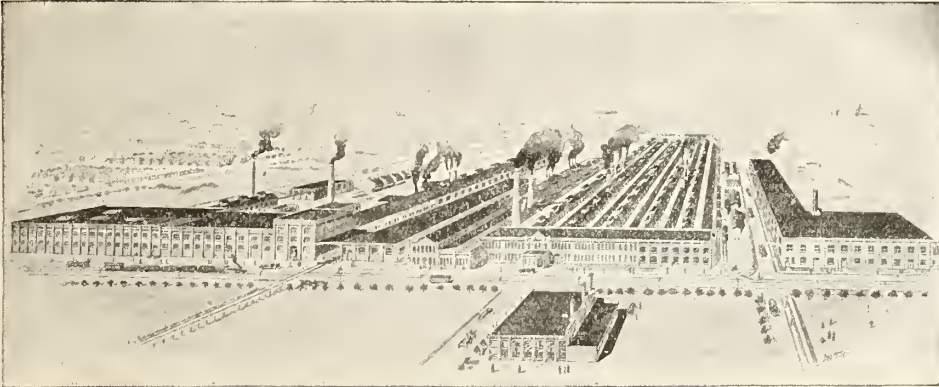
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AGENCIES:

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MANITOBA and NORTHWEST:
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A. O. Campbell,
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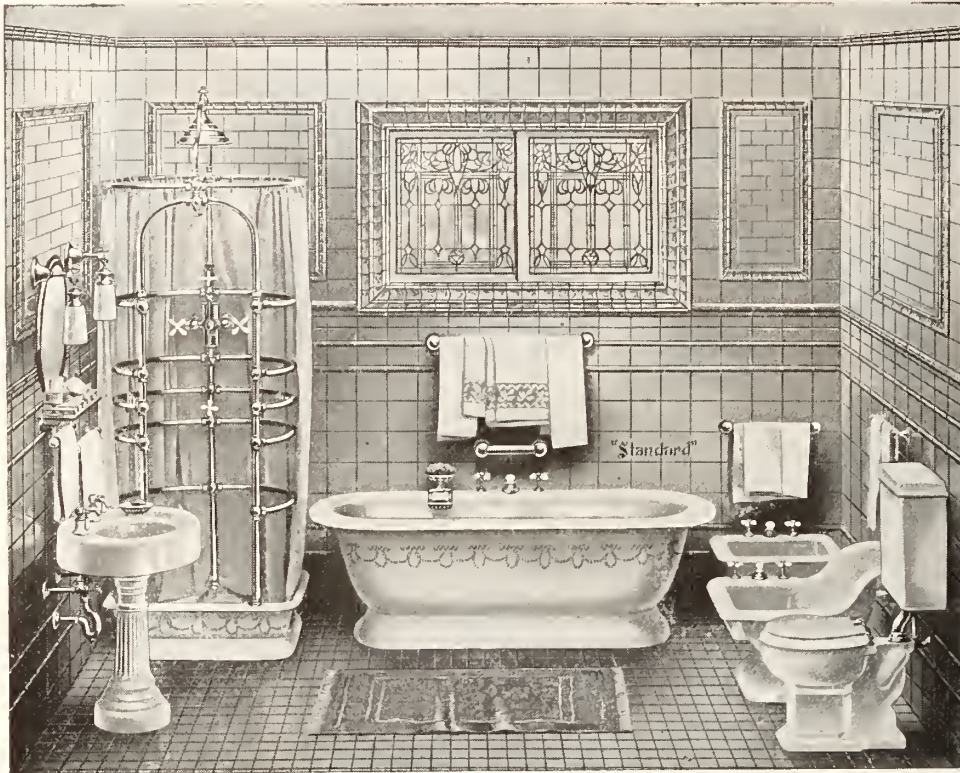
VANCOUVER

CATALOG FURNISHED UPON REQUEST



"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

"Standard Sanitary" Plumbing Fixtures



"Standard Sanitary" Bathroom of Queen Victoria of Spain.

The above cut was made from a photograph of the fixtures actually installed in the Royal Palace of La Magdalena, Santander, Spain, the summer residence of their Majesties, the King and Queen of Spain.

A similar bathroom was also installed for the King, and eighteen other complete "Standard Sanitary" Bathrooms for the other members of the household.

This is an extremely practical and beautiful interior and combines with beauty and refinement every modern sanitary idea.

The fixtures are set into the tiling, thus offering no place for dust or moisture to collect, and reducing cleaning labor to a minimum.

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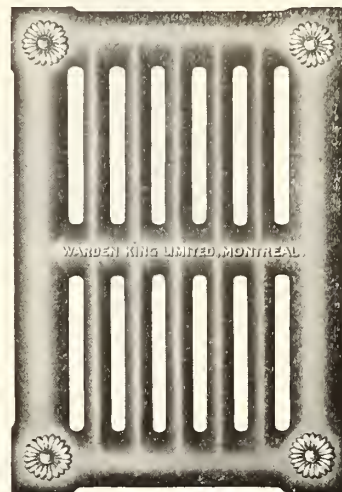
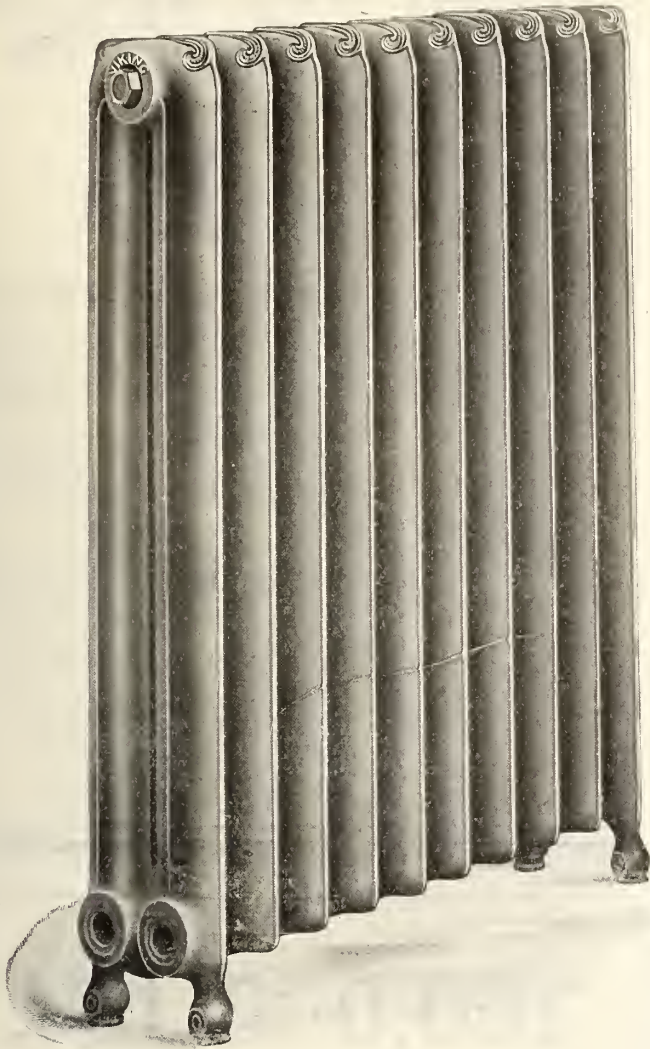
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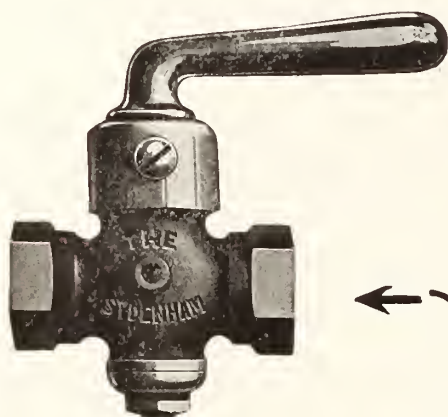
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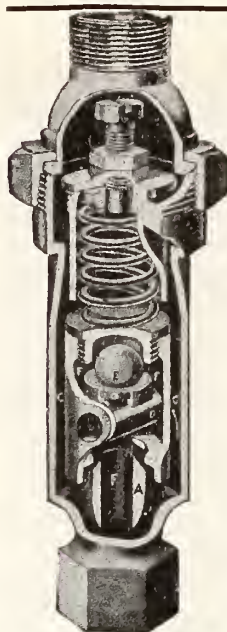
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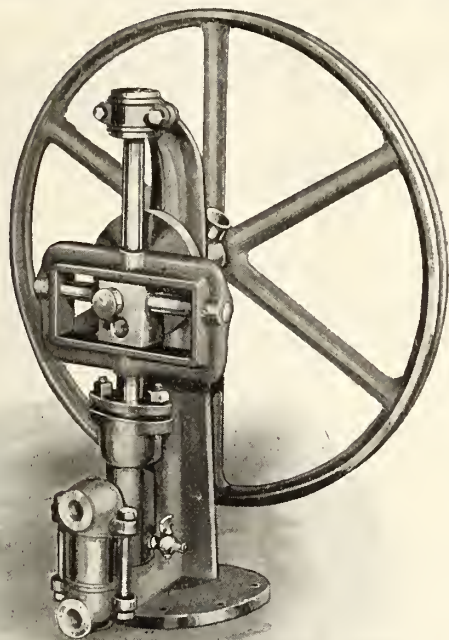
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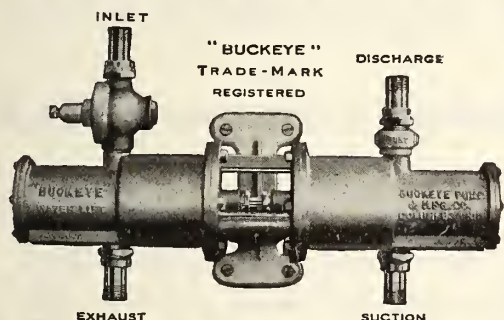
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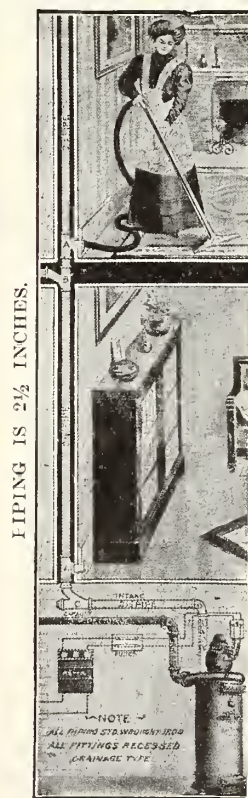
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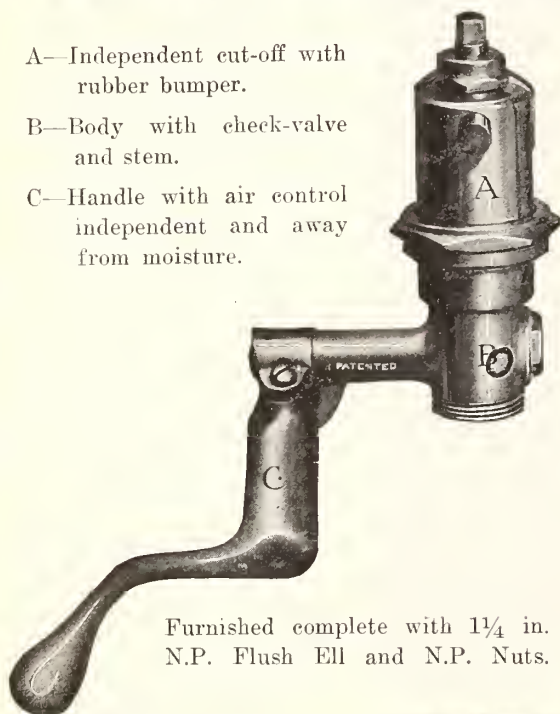


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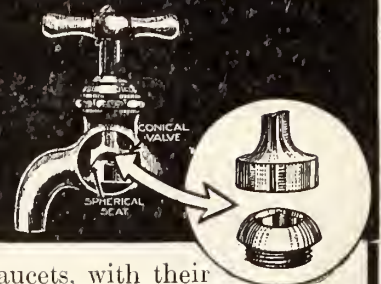
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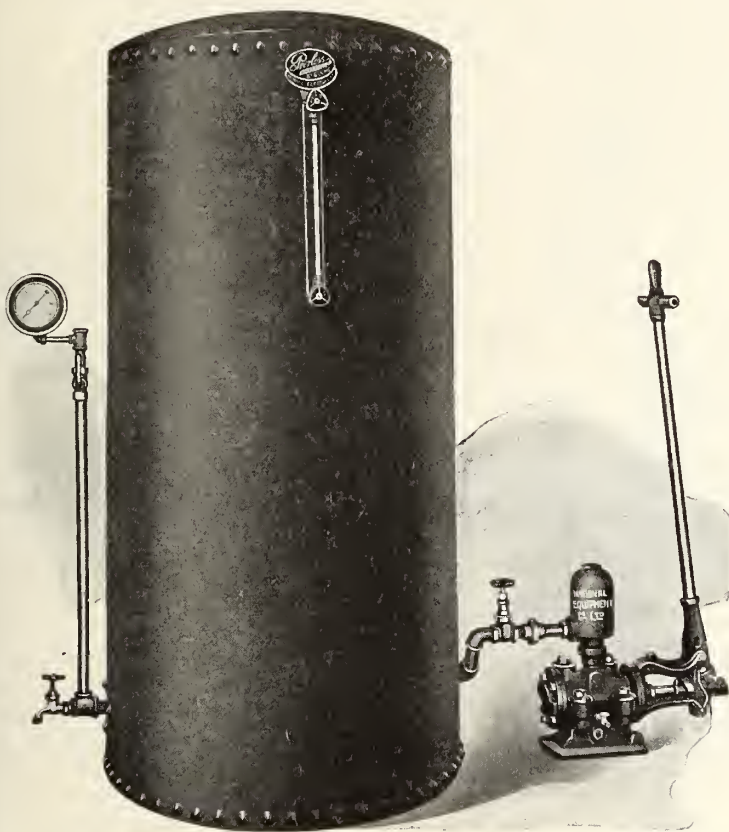
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Which would make for you the most money per hour?

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Toronto, Canada

SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, MAY 1, 1914

No. 9

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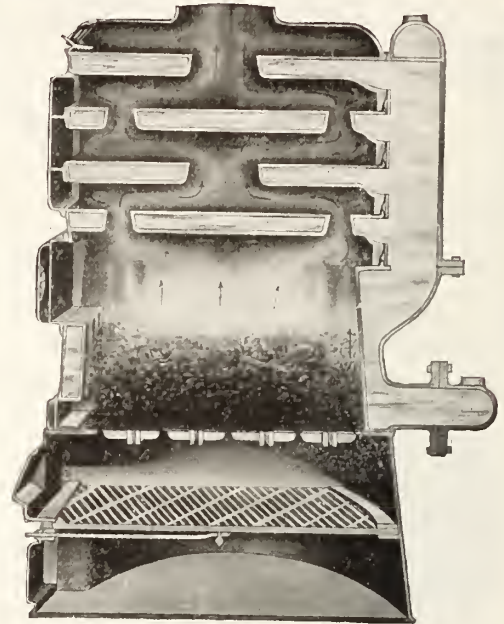
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"KING" Boilers carry our unqualified guarantee.

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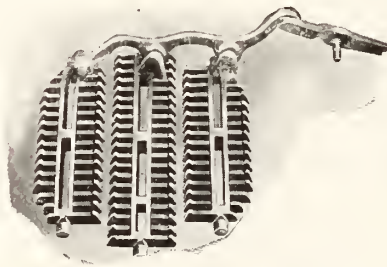
The talking points on a "KING" Boiler are numerous, in fact too numerous for us to attempt to explain them in this limited space. A few of them need no explanation and are shown in the accompanying cuts.



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The large one-piece ashpit.
The special shaking grates and convenient shaking arrangement.
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The easily-cleaned flues.
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The ease of erection.

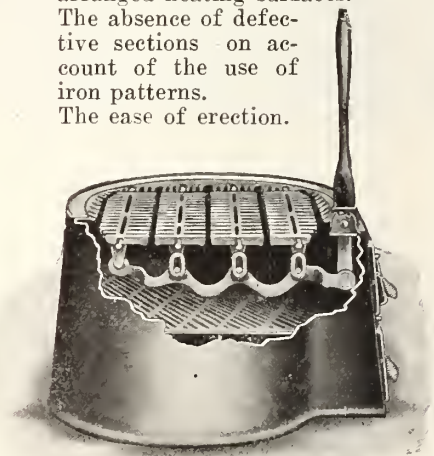


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THE SANITARY ENGINEER

VOL. VIII.

MAY 1, 1914.

No. 9

Province of Saskatchewan Bureau of Public Health

Being Suggestions With Reference to the Design of Sewage Treatment Works for Municipalities in the Province.

Sewage Treatment Works. Bulletin No. 1

The following suggestions are formulated upon principles of sewage treatment which are in accordance with present-day practice, and are intended only to serve as a guide to those preparing schemes for municipalities in the Province of Saskatchewan.

In submitting these suggestions, it is not the intention to limit any tendency towards originality of design or to discourage the incorporation of new features. In order that the intention of this bulletin be not misinterpreted, let it be understood that under certain circumstances:

Sewage treatment works designed at variance with these suggestions may be approved of by the Commissioner of Public Health, and conversely,

Sewage treatment works designed strictly in accordance with these suggestions may not be approved of.

Modifications may be necessary to meet the requirements of local conditions.

Bureau of Public Health,
Regina, Sask., March, 1914.

1. SCREENING.

(a) That where sewage is to be pumped, provision be made for screening, cleaning the screens at regular intervals, and for removing.

(b) That where works are of a character producing a large quantity of screenings, mechanical means be provided for their removal.

2. GRIT CHAMBERS.

(a) The function of grit chambers (or detritus tanks) being to arrest the heavier mineral particles carried in suspension, the construction of such tanks, is, generally speaking, unnecessary in this province, where the majority of sewage systems are designed on the "separate" principle.

(b) That in special cases where sand or other mineral particles cannot be kept

out of the sewerage system, it is advisable to introduce grit chambers.

(c) That these be constructed in multiple compartments to take care of the varying volume of flow.

(d) That a lineal velocity of one foot per second be aimed at, calculated to retain the heavy mineral, but not the organic matters.

3. PUMPING.

(a) That where it is necessary to raise the sewage at the works it is advisable that all machinery be in duplicate with alternative forms of power in case of failure.

(b) That appliances for raising sewage be specified with reference to efficiency in dealing with solids.

4. SEDIMENTATION.

(a) That there be at least two sedimentation tanks.

(b) That such tanks be so constructed that the precipitated solids are automatically and continuously removed from that portion of the tank in which precipitation takes place, and that a tank or chamber combined with, or separate from, the sedimentation tank, be provided, into which the precipitated solids may pass by gravitation immediately following settlement.

(c) That consequent upon the modern requirement of the continuous removal of sludge as above stated, all base slopes of sedimentation tanks be made as near to the perpendicular as is practicable, relative to general construction.

(d) That the tank capacity be equal to one-fifth of the dry weather flow in twenty-fours, or equal to three hours' flow calculated upon the twenty-four hours' dry weather flow taking place in fifteen hours.

(e) That the cross sectional area of the tanks provide a velocity of flow of not more than .05 foot per second, while lower velocities are preferable. Flows may be either vertical or horizontal.

(f) That consideration be given to the design of the inlets and outlets with a

view to ensuring uniformity of flow throughout the breadth of the tank, and the absence of stagnant sections; and that all channels and parts of the tanks apart from the sludge storage area, be so constructed that no solids are retained.

5. SLUDGE STORAGE.

(a) That the overall depth of the sludge storage chamber, from the surface of sewage in sedimentation tank be generally not less than fifteen feet. Greater depths may be adopted, producing a more concentrated form of sludge.

(b) That in deep tanks, wherever possible, provision be made for breaking up the sludge at the inlet to the sludge removal pipe.

(c) That the capacity of the sludge storage chamber be equal to at least four months' precipitation of sludge, containing 85 per cent. of water. Greater storage capacity is preferable as septic action is delayed in winter months. The cubic capacity of the sludge storage chamber shall be taken as only that space which is below the level of the deepest point of the sedimentation tank. In general, the average accumulation of sludge may be taken as three and a half cubic yards per million gallons of sewage on the above basis of dilution.

(d) That ample provision be made for the escape of gases from the surface of the sludge storage chamber.

(e) That pipes for the conveyance of sludge be of an internal diameter of not less than eight inches and that the inclination of such pipes, where the sludge is discharged by gravity, be at least 3 per cent. and preferably 5 per cent.

6. BIOLOGICAL FILTRATION.

(a) Where a dosing or siphon chamber is constructed to regulate the flow of the sewage over the surface of filter beds, that the capacity of such chamber does not exceed a ratio of two gallons of sewage to each square yard of filter surface. For instance, if the area of the filtering

surface be two hundred square yards, the capacity of the dosing chamber should not exceed four hundred gallons, representing a dose of one-half inch depth of sewage over the whole surface of the filter.

(b) That the depth of the filter media be not less than four feet and preferably seven feet.

(c) That the filter media for effluents from the above form of tank be composed of hard broken stone or other suitable material, broken the one inch to two-inch cubes.

(d) That the surface area of filtering media for domestic sewage be in proportion to the population using the sewers, i.e., in proportion to the amount of oxidizable matter present in the sewage.

Where a high degree of oxidization is required, the ratio of population to surface area of filter media should be approximately 17,500 persons to the acre (or 275 square yards per 1,000 population).

This corresponds to a rate of filtration of 1,750,000 imperial gallons per acre per day, or 155 imperial gallons per cubic yard per day (assuming depth of filter media to be seven feet) at a per capita flow of 100 imperial gallons per day.

The efficiency of filters will not be materially affected by increasing the rate of filtration during periods of storm to say three times the above stated rate, provided that the increase in volume is due to clear water.

In cases where the volume of dilution at the point of final discharge exceeds twenty times the volume of the sewage effluent, higher rates of filtration may be adopted.

(e) That the method or apparatus adopted for the distribution of liquid over the filter bed, shall ensure a uniform distribution over the whole surface.

(f) That all filter beds be drained at the base by tile pipes or preferably by means of a false floor over the entire base of the filter.

(g) That sufficient provision be made for ventilation to allow of oxygen being present at all times and in all parts of the filter bed.

7. HUMUS SETTLING TANKS.

(a) That it is generally advisable to provide settling tanks for the removal of the humus which is unloaded by the filter beds from time to time.

(b) That such tanks be constructed in every case, where disinfection of the final effluent is adopted.

(c) That humus tanks have a capacity equal to one forty-fifth of the dry weather flow in twenty-four hours, or equal to twenty minutes' flow calculated upon the twenty-four hours' dry weather flow taking place in fifteen hours.

(d) That it is desirable that such tanks have separate storage compartments as in the sedimentation tanks above described.

8. DISINFECTION.

(a) That where chloride of lime is used for the disinfection of the final effluent, provision be made for weighing, measuring and storing the disinfectant in a dry covered building.

(b) That the period of contact between the disinfectant and the sewage be not less than fifteen minutes. An open pond or lagoon will serve this purpose.

9. EFFLUENT PIPE.

That the effluent from the works be discharged into the watercourse or lake in such a manner as will ensure a maximum amount of dispersion.

10. HOUSING OF TANKS AND BEDS.

(a) That all parts of the works containing sewage under treatment be housed to conserve the latent heat of the sewage during low temperatures and to prevent fly nuisance in summer.

(b) That such covers be designed to enclose the minimum amount of space, at the same time giving room for accessibility and inspection.

(c) That with properly designed covers the introduction of artificial heat is unnecessary in sedimentation tanks, and may be obviated in filter beds.

(d) That provision be made in all covers for the access of light and for efficient ventilation.

11. LABORATORY.

That wherever the size of a municipality or other circumstance warrants its construction, a small laboratory be provided and equipped in which simple tests may be made of the sewage and effluents.

12. LAYING OUT THE SURROUNDING GROUNDS.

That provisions be made in the specifications and estimates for laying out, grading and improving the appearance of the surrounding grounds by terracing and seeding the slopes.



DR. HASTINGS ON HEALTH REFORM.

In a lecture to the Royal Canadian Institute, Toronto, Dr. Chas. J. Hastings, the M. O. H., recently made a strong appeal for co-operation by the community to stamp out preventible diseases and improve the race.

Eugenics, he said, was the science that dealt with all the influences that improved the inborn qualities of a race. It took into consideration theories of natural inheritance, variations, selections, etc., and by scientifically tracing these fundamental elements through the life histories of generations, it endeavored to arrive at a satisfactory method of improving generally the mental and physical developments of

mankind. Eugenics was divided into the negative and the positive. The negative sought to prohibit the marriage of the unfit and thereby prevent a reproduction of that material; the positive dealt with the fostering of the inherent good, mental and physical, in man.

The slums of our cities, he said, afforded the very hotbeds of disease, vice and crime. There could be little doubt that legislation should be enacted to prevent the reproduction of degenerates. "We spend tens of thousands," he said, "in examining immigrants in order to exclude undesirables, such as feeble-minded, criminals, degenerates, and those suffering from communicable diseases, and have legislation to warrant our doing so, but we are permitting the reproduction of the same class that we are rejecting, and make no effort to stop it or to improve the environment of such."

They were told that it would take ages to wipe out drunkenness; yet in the span of one lifetime the social conscience had done more to wipe out the vice than many generations of heredity. For, he pointed out, not only was form inherited, but also the laws of organic memory, the capacity for making habit.

"House, feed and teach children decently," he declared, and we shall find geniuses in all conditions of men. When we give all children an equal chance we shall see with what we have to fight in heredity." If they would have higher human efficiency they must first secure better living conditions.

Dr. Hastings laid special stress on the necessity for hygiene in all respects. Communicable diseases thrive where hygiene was neglected.

In this connection the lecturer said it had been estimated that 20 per cent. of efficiency was lost in teachers and pupils in all public schools on the continent through improper ventilation. "Probably the most potent factor in bringing about the great sanitary awakening we are now experiencing," he declared, "is the result of the capitalizing of labor, and the placing of a monetary value on human life and human efficiency."



A COMMENDABLE BOOK.

We have recently had another splendid book sent in for review. This book is entitled "A Manual of Technical and Sanitary Science," by S. Barlow Bennett. In this manual Mr. Bennett has put before the craft a book which should be in the library of every sanitary and heating engineer. It takes up every phase of leadworking, joint wiping, sewage disposal, pumps and every other phase required in the science of sanitary engineering.

Sanitary Engineers and Water Supplies

Showing Attitude Sanitary Engineers Should Take Regarding Water Supplies, so as to Avert Such Conditions as Prevail in Most of Our Large Cities.

WE are, as a craft, awakening to the fact of a responsibility which will in the near future be laid at the door of sanitary engineers. Civil engineers have given the inhabitants of our cities and towns anything but good water supply systems. There are waterworks engineers, water experts and a score of other experts who have more or less dabbled and botched the various water supply systems. Ottawa's water supply was all to be desired until the population increased, and the city grew beyond the location of the intake pipe. Then the inhabitants at summer resorts are allowed even to-day to pollute the river all along its shores. If sanitary engineers had sounded a warning note, and refused to install private sanitary drains to empty into the rivers, such wholesale pollution would not have taken place, at least not to the extent which it has done.

Then from an engineering standpoint let us cite the recent calamity which occurred in Montreal when the intake pipe collapsed. Experts again had a hand in the work, and look what a terrible position the city of Montreal was placed

in as a result of such poor engineering skill. There is every chance for a repetition of the calamity happening at any moment. Just imagine what would have happened in Montreal, had a wind come along; the city would have been little better than a mass of ruins. Therefore, seeing that so many supposed experts have held sway and results have proved so disastrous to both life and property, it is high time sanitary engineers took a look into the matter.

Water supply problems are just as much a sanitary problem as sewage disposal systems, and looking back at the actual accomplishments of the old-time plumber to the sanitary engineer of the present, no craft can claim to having made as much real progress, which has been, and is, of such vital importance to humanity. The recent Woodbine Hotel fire in Toronto, credited the Health Dept. with objecting to the location of the bathrooms, because they were not directly connected to the outside air, but were built in the centre of the building, and in that way were liable to pollute the atmosphere in the hotel, yet we are

told the architects spoke of the objection as merely of a technical nature, and all along the line such catastrophes are taking place under the present regime of experts so-called. The public will not be long before they will begin to look into these matters and give credit where credit is due, and sanitary engineers as a whole, should rise to the occasion, and show the public what they have been doing and are able to do for the general welfare of humanity as a whole. New sanitary by-laws require to be drafted and put before the city councils all over Canada, and every effort put forth to enforce such by-laws. It would have done the public good to have heard how the members of the Ontario Domestic Sanitary and Heating Engineers discussed the various subjects along lines of sanitation, water supplies and sewage disposal plants, and the data collected from all the towns and villages in Ontario to show what is being done to improve the filthy conditions which prevail, not only in small towns and villages, but also in large cities in Canada.



A break in the intake pipe which caused Montreal's water famine.

The Sanitary Engineer

Plumber and Steamfitter of Canada

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TORONTO, MAY 1, 1914

INSPECTION AND INSPECTORS.

IN a future issue we will place before our readers another case where the plumbing in a public school has been installed in anything but an up-to-date manner, and has been passed by a plumbing inspector, who in all good faith has been employed by a civic body to safeguard the interests of its citizens. Such inferior installations would not be so bad were it not for two reasons: first, that sound sanitary engineering is necessary from the standpoint of good health, and second, sanitary installations are built to last for an indefinitely long period, and therefore should be of the most modern design. Here is a case where modern sanitary science has played no part, where an inspector has passed work of an out of date nature, and worse still, has received the expert support of the architect. Any architect who will indorse such an installation is only proving in a more forceful manner the opinion expressed in "Sanitary Engineer" of his unfitness to have anything whatever to do with sanitary heating or ventilating engineering, and the sooner all such work is taken out of the hands of architects, the better it will be both for the public and the trade. As regards the inspection of plumbing, this should only be done by practical men, who not only are in sympathy with the cause of sanitation and its progress, but who have also had the practical experience which alone fits them for such positions as plumbing inspectors. These men should know just how, when and where a by-law could be departed from, or, in a word, should know how to conform to the laws of sanitation under circumstances which any particular by-law did not fully cover.

THE HEATING QUESTION.

DURING the past year, and up to the present "Sanitary Engineer" has been advocating that some authority should be exercised with regard to the heating and ventilating of our residences, office and factory buildings, etc., with a view to eliminating the evil which prevails, where too small a sized boiler and insufficient radiation is being installed, and where cheap hot air furnaces are being provided which have no connection with the outside air. Several instances of this kind have lately occurred during the past winter in which on account of the poor construction several deaths have resulted. "Sanitary Engineer" feels that there is no more fertile source of danger to health than either under- or overheated buildings, more especially the latter, which

are generally also poorly ventilated. Now, while we have had our opinion indorsed by hundreds of heating engineers as well as by quite a number of the general public throughout the Dominion, we have at last been confronted with one or two persons who feel that such legislation would be not only harmful but also arbitrary. We would therefore like to hear from some of our readers their opinions upon the subject.



GET OUT FOR NEW BUSINESS.

ANOTHER way the craft can assist in this campaign is by going after the owners of houses which have poor installations in their property; and there are lots in Toronto. It has often occurred to the writer that if every employer would ask his men to report the general conditions of an installation when being called in to make repairs, then follow up such reports at such a time as is being experienced just now, when business is not the best and when men are plentiful, such following up would certainly be more remunerative than figuring on jobs in an architect's office, where you know there are any number on the job as well as yourself. So again let us voice the slogan, clean up, paint up, both in your own establishment as well as in those of your customers.



CLEAN UP, PAINT UP.

OF all slogans, that of "Clean Up, Paint Up" seems to be the most popular at this season. Medical health officers are voicing the cry, newspapers are forwarding the movement, manufacturing companies are responding in every way possible. Trade papers are also advocating the movement. In fact, it's nothing more nor less than a national spring cleaning, and a regular "Swat the Fly" before its arrival.

What are we sanitary and heating engineers doing to help on the good work? Are they allowing that old W. C. bowl, that old bath, those old fittings and pipe ends to fill up every nook and corner, or are they getting the latter threaded up, calling in the junk dealer. Say boys! What a conglomeration of funisities would be seen if all the junk from every plumbing and heating shop in Toronto were to be collected and piled into one big heap. It would be "some heap," and how many would have to scratch their heads and wonder where it all came from. So let's up and be doing, and join in the cry of clean up, paint up, e'er it be too late.

An Old and Interesting Trade Document

Showing That For Over 500 Years Plumbers Have Been Trying to Uplift Their Craft as Well as Cater for the Protection of the Public at Large, That They Are Still Endeavoring to Have Laws Passed With the Same Aims in View.

OLD documents relating to the various ancient trades and professions are always of great and exceptional interest, inasmuch as they are the only authentic record of the conditions prevailing in past ages, and consequently the foundation upon which are built up trade and commercial history.

Had our ancestors taken greater pains to preserve the documents a good deal more valuable material would have been preserved to us concerning the condition, standing and history of the different trades in olden times. It is a matter for congratulation, however, that there are several account books, minute books, etc., preserved in the various archives of London, which serve to throw many interesting side-lights on the old-time trades and professions.

The following "Ordinances of the Plumbers," which it is hoped will be of interest to readers of this paper, date from 1365, the 38th year of the reign of Edward III., and were originally written in Norman-French:

"May it please the honourable men, and wise, the Mayor, Recorder and Aldermen of the City of London to grant unto the plumbers of the same city the points that here follow:—

"In the first place, that no one of the trade of plumbers shall meddle with works, touching such trade within the said city, or take house or apprentices, or other workmen, in the same, if he be not made free of the city, and that by assent of the best and most skilled men in the same trade, testifying that he knows how well and lawfully to work, and to do his work, that so the trade may not be scandalized, or the community damaged and deceived, by folks who do not know the trade.

"Also, that no one of the said trade shall take an apprentice for less than seven years; and that he shall have him enrolled within the first year, and at the end of his term shall make him take up his freedom, according to the usages of the said city.

COMMENT.

It is very interesting to note by this document the plumbers have for over 500 years been trying to get laws and by-laws passed with the main view of protecting the public at large more than themselves. To-day the craft is doing the same, but the moment a law of such a nature is spoken of, the cry of monopoly, trust, graft, is spread abroad. The strangest part of all is, we have no millionaire plumbers who have actually made their money in trade, and also that quality for quality, plumbing is cheaper to-day than it was 20 years ago, in spite of the fact that every other commodity is higher in price as well as in many cases inferior in quality.—Editor

"Also, that everyone of the trade shall do his work well and lawfully, and shall use lawful weights, as well in selling as in buying, without any deceit or evil intent against anyone; and that for working a clove of lead for gutters, or roofs of houses, he shall only take one half-penny; and for working a clove for furnaces, tapper-troughs, belfreys, and conduit pipes, one penny; and for the waste of a wey of lead when newly molten he shall have an allowance of two cloves—(probably about 14 pounds in 180; but the weight of both clove and wey is varying)—as has been the usage heretofore.

"Also, that no one for any singular profit shall engross lead coming to the said city for sale, to the damage of the commonalty; but that all persons of the said trade, as well poor as rich, who may wish, shall be partners therein at their desire. And that no one, himself or by another, shall buy old lead that is on sale, or shall be, within the said city or without, to sell it again to the folks of the said trade, and enhance the price of lead, to the damage of all the commonalty.

"Also, that no one of the said trade shall buy stripped lead of the assistants to tilers, lagers (layer, meaning layers of stone or the flat bricks then used), or masons, or of women who cannot find warranty of the same. And if

anyone shall do so, himself or his servants, or if any one of them shall be found stealing lead, tin, or nails, in the place where he works, he shall be ousted from the said trade forever, at the will and ordinance of the good folks of such trade.

"Also, that on one of the said trade shall oust another from his work undertaken or begun, or shall take away his customers or his employers to his damage, by enticement through carpenters, masons, tilers, or other persons, as he would answer for the damage so inflicted, by good consideration of the masters of the said trade.

"And that if anyone shall be found guilty under any of the Articles aforesaid, let him pay to the Chambers of the Guildhall in London for the first offence, 40 pence; for the second, half a mark for the third, 20 shillings, and for the fourth 10 pounds, or else forswear the trade."

A note accompanying the foregoing document states that Thomas Atte Dyche and Thomas Beauchamp were elected overseers of the said trade on the 24th January, in the 38th year of the same reign.—Plumbing Trade Journal, England.

BILL H.R. 14288.

Relating to Contracts for the Erection or Alteration of Public Buildings.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that every department or board, bureau, commission, body, or person charged with the duty of preparing plans, specifications, and blue prints for the erection, alteration, or repair of any building in any state or territory or in the district of Columbia, by the United States, and every officer or person designated by such department, or board, or bureau, or commission, or body to act

(Continued on page 24.)

REMEMBER

The next Annual Convention of the Canadian Institute of Sanitary Engineers will be held in Edmonton, May 4, 5 and 6

THE DAY OF EXPLANATION

DOING BUSINESS UNDER A NEW IDEA "THE PUBLIC BE TOLD"

By JAMES H. COLLINS

Illustrated by CHAS. D. MITCHELL

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A TELEPHONE company planned to put its cables underground in the residence section of a certain city. To do this, right-of-way must be secured over private property in each block. A telephone cable is a highly sensitive affair. It is full of tiny copper wires, insulated by porous paper, looking a good deal like firecracker fuses, and a very little moisture will impair working. These wires are incased in a thick lead sheath like a waterpipe, and the cable is put underground to stay intact, being opened only in emergencies—so its interior will always be dry.

Each city block given telephone facilities from an underground system is served by a number of wires that are tied out of the main cable at the time it is laid. These wires for each block are sealed up in their own tight lead sheath against moisture and laid over back fences, along walls, or wherever they can be put inconspicuously and safely.

Here is where trouble came in. That fine residence section had no back fences. On each block stood from six to a dozen handsome mansions, surrounded by wide expanses of beautiful lawn. Neighborhood spirit had enabled property owners to abolish fences, hedges, sheds and other obstructions, and hardly a clothes pole broke the smooth sweep of grass and shrubbery. So when the telephone company asked for the right to put up poles and string cables over those lawns there was determined opposition.

Property owners maintained that such constructions were unnecessary. Look at the water and gas pipes—all underground. Look at the underground electric light wires—all buried. Why, in the downtown section of the city, where most of them had offices, the telephone wires were out of sight! If they could be concealed there they could be concealed here. So said the property owners.

As logic that was all right; but as engineering it overlooked certain perverse habits of materials under given conditions. So the company tried to explain. The explanation involved technicalities. Really to understand what could and what could not be done in the circumstances the property owners had to get

a view of telephone engineering from the beginning of the art.

Right-of-way men undertook the explanation first. They were salesmen at bottom and skilful talkers. When property owners undertook to argue technicalities from the logic standpoint the right-of-way men were not always able to meet their arguments. The latter were suspected of being smooth talkers, anyway. After they had won over two or three owners in a block, one of the neighbors could upset the whole scheme for unit service in that block.

Then the company sent engineers to explain, as they were more at home in the technicalities; but the engineers were not skilful talkers and made no more headway. By that time property owners reasoned that, as the company could afford to send all these men to argue, the little right-of-way over their back yards must be immensely valuable.

"Something behind this—telephone company trying to catch us napping!" said they; and they formed a neighborhood association to protect their liberties. So the chance of carrying out the improvement seemed poor. Already the cost of reasoning with owners was far out of the proportion to profits on traffic from that section.

Finally the company tried another method. A magazine writer was engaged to present the facts. He knew little about telephone technicalities, but made his living by putting facts on paper so they would be clear and entertaining to the average reader. He was sent round to see various types of telephone constructions, along with an engineer to explain; and when he understood the subject fairly well he wrote a little book about it, which the company printed and distributed through the hostile territory.



The Right-of-Way Men Were Suspected of Being Smooth Talkers.

The technicalities of the subject were so many that nobody could make them clear in conversation. That was where the salesmen and engineers had failed. But when the trained writer took hold of them, put them in order, lighted them up with illustrations and stories, and emphasized the main points by pictures, the case was clear enough and even entertaining.

Company men had argued from the company standpoint; and no matter how honestly they had put the facts, people still felt that they wanted something of value. But the writer was impartial. He had nothing to sell—no object in winning anybody over to anything. If he liked one of his facts more than another it was only because it might be more striking or entertaining to the average person; so he spread all the facts out where readers could see them and let them decide what they would do if they were telephone engineers facing the same situation.

This method was effective. Each property owner got the facts in such shape that he could absorb them at his leisure. The cost was only a few cents for printing.

Eventually the company carried out its improvement with little opposition.

In business generally this is a day of explanation. More and more the public is disposed to look into everybody's way of doing business, with a view to seeing whether things are being done well; and the investigation is either pleasant and profitable when the people who run the investigated business meet the public half-way—or just the opposite if they try to avoid investigation.

A generation ago there was little curiosity on the part of the public; or, if there was, the executive running a big concern denied any right to poke into his affairs. That was the public-bet damned era!—before regulating commissions had been created. People had little curiosity about the way business was managed, simply because they had no money interests at stake—or very little.

To-day the executive under fire often wonders that the public should be so keen in criticizing his management. "They never did this in the old days!" he protests in amazement. But one simple illustration will show how times have changed.

The first trolley system struggled into existence less than thirty years ago. In those times street car fare was only an incident to the people who lived in our compact towns and cities.

There were no suburbs to speak of, and the office man often walked home to dinner at noon.

Now, however, electric transportation has so magnified our towns and cities that even the family of the wage-earner

spends from sixty to seventy-five dollars a year in street car fares. That is the equivalent of at least two months' rent. It brings everybody in contact with the street car system every day, and naturally there is keen interest in every detail of service.

The same money expenditure keeps the public intent on gas, electric light, railroad, telephone and all other public service corporations.

Expansion in the making and distribution of food, clothing and other goods has turned the general attention to practically every business.

When business men woke up to the reality of this demand for information they resorted at first to special pleading. The attorney was called in to prepare statements that put the business in an attractive light and the press agent busied himself getting these in circulation; but the muckraker was busy with special pleading on the other side. He had the great business advantage of having started first. Criticism continued.

Forty Cents' Worth of Information.

Nowadays the business man is beginning to see that what the public wants is the plain technical facts and that most of the misunderstanding arises from ignorance of the technicalities. Many an executive is still trying to quiet clamor by defensive logic and special pleading; but the men who are meeting criticism to the best advantage are those who have found that facts, clearly stated, make the best special plea.

A man walked up to a public telephone station.

"Long distance," he said—"I want to talk with Dr. Miller, in Boston—get the doctor himself."

The toll rate from that place to Boston was eighty cents. Several minutes later the operator reported that Dr. Miller was not at his home, and the man said nobody else would do.

"The charge is forty cents," said the operator.

"But why should I pay anything when I haven't talked with my party?" asked the man.

If the operator had replied merely, "It's the company rule," he would have gone away feeling cheated; but this operator had looked into toll charges a little deeper than that.

"Because," she said, "to get you the information we used a Boston wire valued at thirty thousand dollars—or forty cents a minute."

"Is that so?" said the man in surprise. "Well, I'll pay it then. If that's the case I'm getting out easy for forty cents."

This is the day of The public be told! In its dealings with public service corporations and business houses generally

the public constantly has occasion to ask Why? regarding methods and conditions. The business concerns that get on most happily are those able to meet inquiry with a clear Because, involving a statement of some technical points that the public does not see, but which usually restores good feeling when those points are skillfully explained. Where a lucid, reasonable Because is not forthcoming things may go very unhappily.

About two years ago there arose in the city of New York a persistent outcry against hotels and taxicab companies. The hotels maintained taxicab stands in the public streets before their doors, from which only the cabs of certain companies were allowed to take up passengers.

As much of the cab traffic centres round hotels there were protests by outside cabowners, and these ultimately led to an investigation, new laws and a regulation of fares very unwelcome to the big companies.

In all the clamor the companies sat tight and kept mum. The attorneys appeared before the investigators to present their case, but that did not prevent the change in laws and rates that brought competition of cheaper cabs.

Cheap cabs, when they materialized, did not prove to be an unmixed public blessing, because the strict police regulation of cabs in foreign cities was not provided; and it seems to be generally agreed to-day among people who use taxicabs in New York that it might not be safe to trust oneself far with some of the drivers of chance taxicabs that ply the streets, and certainly questionable so far as sending a woman anywhere with them alone—some of these cabs, not all.

The hotels and taxi companies furnished their own police regulation under the old scheme. They were doing something that should have been done by the city government, of course, and were well paid for it; but the service seems to have been necessary and worth the money. Their drivers were known and frequently checked; so it was safe to ride with them. The hotel guest could take one of their cabs and have the fare charged in his hotel bill.

In one instance a woman took a company taxi from a hotel to an ocean steamer. Several hours after sailing she reported to the hotel by wireless that her purse had been left in the taxi, with several hundred dollars in it. The hotel manager telephoned the taxi company and recovered the purse, which had been turned in by the driver.

This was the true Because of the taxi situation. It never got before the public effectively, however; and when the public's Why? was unanswered there followed action not pleasant to the companies.

All sorts of men, running all sorts of business concerns, are coming to see that nowadays, in all sorts of difficulties that arise in public relations, a good explanation is most effective in straightening out tangles and clearing up misunderstandings.

A big manufacturing company makes high-power locomotive headlights. It was very active in selling them to railroads and roused competition.

Presently in one of the state legislatures a bill was introduced compelling railroads to put such headlights on all locomotives running in that state. At the same time Dame Rumor circulated the report that this company was using the legislature to sell its goods. Incidents of that kind often arise in the heat of competition.

The proposed law had to go before the people in referendum, and the company issued an open letter to the public stating that, though a high-power locomotive headlight was an excellent thing in its place, it was not suited to all conditions of railroad traffic; that railroad men could be trusted to adopt what was best in equipment; and that the company did not believe in the regulation of such technical matters by sweeping state laws. This letter was given wide publicity and when the public came to vote on the law it was defeated.

A trolley company, seeking to relieve pressure on some of its lines during rush hours and to carry the people faster, adopted a system of skipstops and express cars. By letting local cars pick up passengers only at alternate streets, it was possible to run express cars between that stopped only at long intervals.

This was purely a technical matter in the province of the traffic man, who seemed to be doing what he could in a difficult situation; and the public took to the system kindly enough when it grasped the idea.

The city council, however, thought that by ordinance the public might eat its cake and have it too. The company was directed to abolish the skipstop cars and continue the express cars. Thereupon the company explained the situation to the public and took a post-card vote of patrons on lines where the new system was in operation. By a vote of three to two the system was upheld.

One large trolley company has its own weekly newspaper for the public and circulates more than one hundred thousand copies every week through its own cars, the publication being placed in a special box on each car, where passengers can help themselves. This paper is taken home and read. It deals with problems of street-railroad service in articles with such headings as: Why the

street cars sometimes pass you by; Why the rush hour jams the cars; Fighting the snow so all may ride; Building a mile of street railroad; and so on.

That city has passed through the usual street-car development—first, a horse-car system so small that the management was in the hands of one man, who owned a large share of the plant and was frequently seen by passengers bossing the drivers of the bob-tailed cars; then a company to run more horse cars; then the change to electric traction and a bigger company; and then a big system that ran things on an old-fashioned plan, with no regard for the public.

That led to hostility and misrepresentation; and finally a modern management, with a decent respect for the public and a desire to give good service, took hold just at the time when there was the most amazing growth in traffic to be taken care of. A little paper started by the latter management has done much to heal old grievances and smooth public relations.

The present management says, however, that of all the crimes public-service corporations have been charged with the greatest is one they have committed against themselves—the crime of non-publicity.

Public Curiosity Wisely Utilized.

Hundreds of bright, frank young executives connected with big business are developing good public feeling by following this new policy of The public be told! The corporation charged with making too great a profit on its turn-

over, or being involved in high finance, issues its yearly report in popular form, showing processes, equipment, new inventions and improvements, pictures of its products in distant markets, and humane provisions for employees.

Everything possible is done to make human and tangible the bare summaries of the old financial report. One of the ablest railroad presidents in the United States said not long ago that a good deal of the abuses of railroads would stop when the public learns to read earnings statements, and sees evidences that it is being treated pretty well and getting as good service as it is possible to give with the means at command.

And the idea is spreading rapidly in smaller fields. Just the other day a retail druggist in a small town published a voluntary yearly statement of his own to the public. He told his public of his constant study to raise the standard of his business and run it economically, and gave some illustrations to show that it was rather a complicated business, in which a merchant worked hard for his profit and took a good many risks throughout the year.

He wound up by stating that, through careful buying and management, though the town had passed through a period of depression and he had to meet advancing prices in goods, he had been able to pay rent, clerks' wages, lighting and heating bills, taxes and other expenses, and earn eight per cent. net profit on his capital. He left it to the public to judge whether

(Continued on page 30.)



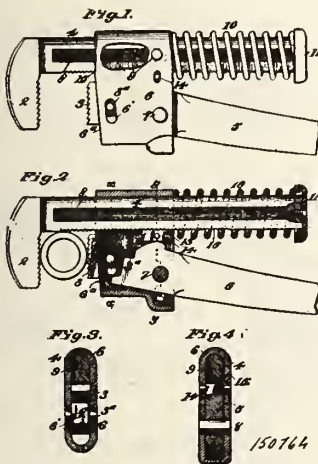
"Why Should I Pay When I Haven't Talked With My Party?"

NEW CANADIAN PATENTS

No. 150,764.

Horace Levaunt Dickson, San Leandro, California, U.S.A., 30th September, 1913; 6 years. Filed 3rd July, 1913. Receipt No. 226,339.

Claim.—1. An improved wrench comprising a pair of shanks, one of which forms a handle and the other is made rigid with an outer jaw, a carrier within which the second-named shank slidably operates a spring surrounding the second-named shank between the end thereof and the carrier, said spring being reactive against the carrier to automatically retract the second-named shank and its jaw, a dog slidably mounted in the carrier having a serrated surface, said second-named shank having a serrated surface engaged by said dog, and a movable slidably mounted in the carrier at right angles to the second-named shank, said first-named shank being pivotally mounted in the carrier having a projecting lug to operate against said dog and force the same into locking engagement with the second-named shank.



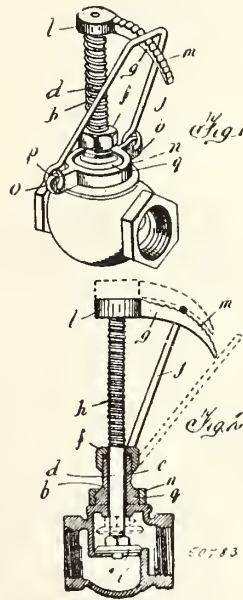
150,764. Pipe Wrench.

2. In a wrench of the character described, the combination with a shank having a fixed jaw and having a toothed surface, a carrier embracing said shank, a movable jaw mounted in the carrier, a second shank pivotally mounted on the carrier, and having a toothed surface to engage the like surface on the first-named shank, said dog being interposed between the two shanks and operated upon by the second-named shank said carrier having an inclined front edge, and said movable jaw having an inclined back engaging said edge whereby the movable jaw has a compensatory movement relative to the carrier.

No. 150,783.

Max Jacobs, Montreal, Quebec, Canada, 30th September, 1913; 6 years. Filed 14th March, 1913. Receipt No. 221,742.

Claim.—1. In a valve, the combination with a casing, of a spring controlled spindle passed freely through the casing, a cam upon the spindle and a single cam engaging arm for moving the spindle the full length of its stroke against the influence of the spring and maintaining such adjustment, substantially as described.



No. 150,783. Valve.

2. In a valve, the combination with a casing having an inlet and a separate outlet in communication with the inlet, of means for controlling the communication between said inlet and outlet including a spring controlled spindle passed freely through the casing, a cam upon the spindle, and an arm adapted to engage with the cam to move the spindle, the relative position of the arm and cam being such that the former is in position to be engaged by said arm during the full stroke of the spindle, substantially as described.

3. In a valve, the combination with a casing having an inlet and a separate outlet in communication with the inlet, of means for controlling the communication between said inlet and outlet including a spring controlled spindle passed freely through the casing, an arm carried by the spindle and having a downwardly curved upper face, and a second arm pivoted upon the casing at one end and bent at its opposite end to engage with and ride over the downwardly curved upper

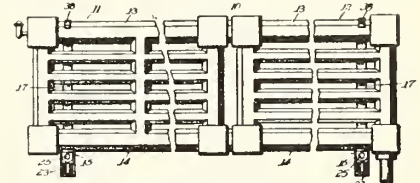
per face of the arm upon the spindle, the distance between the pivoted point of the pivoted arm and the underside of its bent portion being less than the distance between said pivot point and the topmost portion of the arm upon the spindle when the latter is in its lowermost position, substantially as described.

4. In a valve, the combination with a casing, of a spindle passed freely through the casing, a laterally extending arm carried by the spindle, the upper surface of said arm being downwardly curved and having teeth thereon, a spring encircling the spindle and bearing between the said arm and the top of the casing, a sleeve screwed upon the casing and presenting perforated lugs, and a yoke secured at its free ends to such lugs and adapted to engage the toothed surface of the said arm, substantially as described.

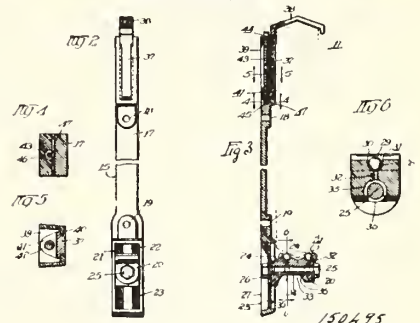
No. 150,495.

August Kehm, Chicago, Illinois, U.S.A., 16th September, 1913; 6 years. Filed 4th March, 1913. Receipt No. 221,293.

Claim.—1. In a hanger for wall radiators, in combination, a plate adapted to be secured to the wall in an upright



No. 150,495

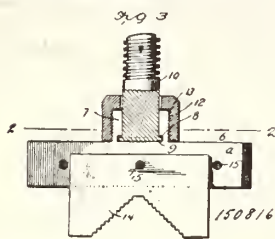
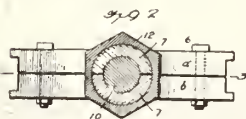
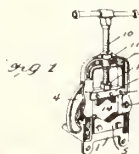


Support for Radiators.

position, its higher end being lower than the upper edge of the radiator, a bracket projecting outwardly from the plate adjacent its lower end and constituting a supporting seat for the radiator, a hooked member adapted for engagement with the upper edge of the radiator and having a downwardly extending shank in telescopic sliding engagement with the higher end of the said plate, and an adjusting screw reacting between the shank of the hooked member and the plate.

2. In a hanger for wall radiators, in combination, a plate adapted to be secured to the wall in an upright position and having a vertical slideway adjacent its upper end, means fixed to the plate adjacent its lower end for engaging and supporting the lower portion of the radiator, a hooked member engageable with an upper part of the radiator, having a shank running in the vertical slideway of the plate, and a vertically disposed adjusting screw reacting between an end wall of the said slideway of the plate and the shank of the said hooked member.

3. In a hanger for wall radiators, in combination, a plate adapted to be secured to the wall in an upright position, a pair of brackets connecting to the plate adjacent its opposite ends and projecting outwardly therefrom for engaging the upper and lower portions of the radiator, one of said brackets being slidably mounted on the plate, and a vertically disposed adjusting screw having its head exposed at an end of the plate reacting between the plate and the slidably mounted bracket.



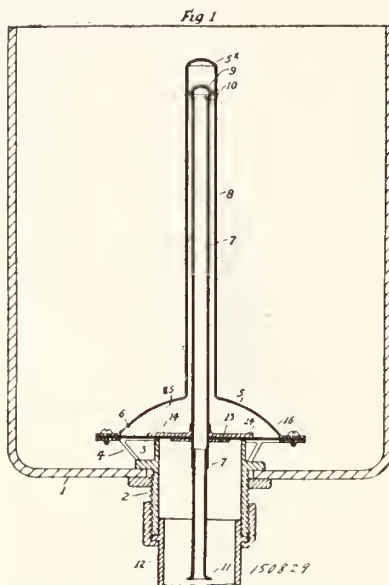
No. 150,816. Pipe Vise.

No. 150,816.

Thomas Pearson, Syracuse, New York, U.S.A., 30th September, 1913; 6 years. Filed 18th July, 1913. Receipt No. 226,957.

Claim.—1. In a device of the class described, the combination of a frame, a movable jaw thereon, an operating screw having an annular flange, said movable jaw having an annular boss provided with an undercut shoulder for engagement with the flange of the screw, and the jaw being divided longitudinally into two parts, in a plane passing centrally through the boss, and a device encircling the boss to prevent spreading apart of the section of the jaw at the connection with the screw.

2. In a device of the class described, the combination of a frame, a movable jaw thereon, an operating screw having an annular flange, said movable jaw having an annular boss provided with an undercut shoulder for engagement with the flange of the screw, and the jaw being divided longitudinally into two parts in a plane passing centrally through the boss, and a nut threaded externally on the boss for preventing spreading apart of the sections of the jaw at the point of connection with the screw.



No. 150,829. Valve and Siphon.

No. 150829.

John Shanks, Barrhead, Renfrewshire, Scotland, 30th September, 1913; 6 years. Filed 3rd April, 1913. Receipt No. 222,718.

Claim.—1. A combined valve and siphon comprising in combination a valve seat member, an apertured structure surrounding the valve seat, a casing having a small aperture, said casing superposed on said structure, a diaphragm interposed between said structure and said casing and adapted to co-operate with the valve seat, and a siphon communicating with said casing.

2. A combined valve and siphon comprising in combination a valve seat member, an apertured structure surrounding the valve seat, a casing having a small aperture, said casing superposed on said structure a diaphragm interposed between said structure and said casing and adapted to co-operate with the valve seat, and a siphon communicating with said casing, said siphon composed of two tubular members, one within the other, the inner tubular member extending through the diaphragm.

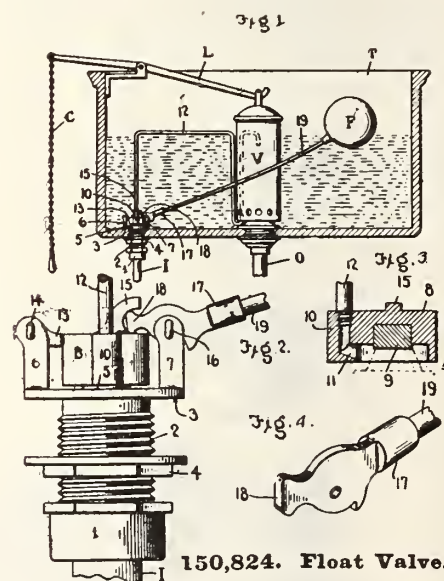
3. A combined valve and siphon comprising in combination a valve seat member, an apertured structure surrounding the valve seat, a casing having a small aperture, said casing superposed on said

structure, a diaphragm interposed between said structure and said casing and adapted to co-operate with the valve seat, a siphon communicating with said casing, said siphon composed of two tubular members, one within the other, the inner tubular member extending through the diaphragm, and a cap affording a substantially annular opening between it and the inner tubular member.

No. 150,824.

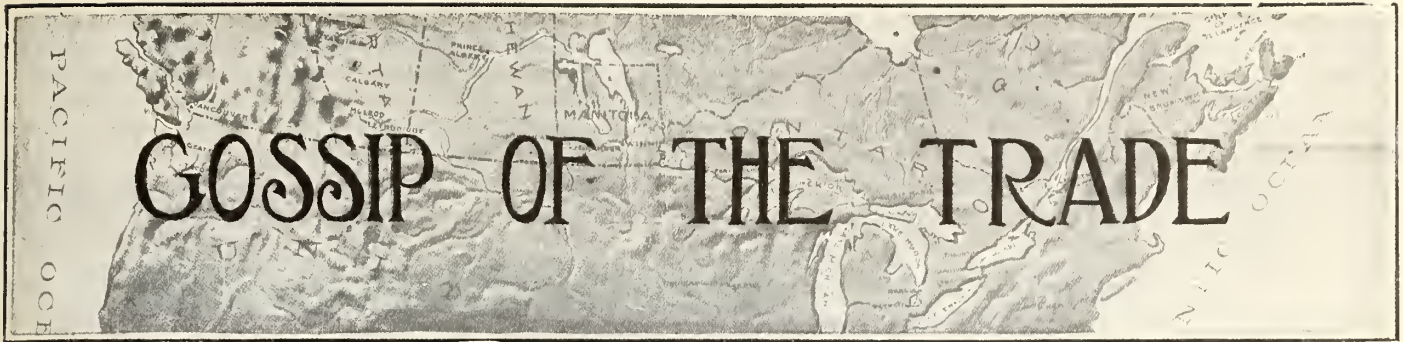
Freeman Rodehaver, Greenburg, Pennsylvania, U.S.A., 30th September, 1913; 6 years. Filed 23rd May, 1913. Receipt No. 224,787.

Claim.—1. In a valve of the class described, the combination with the valve body having a nipple rising therefrom, of a cup-shaped valve head whose shell surrounds said nipple and has a lateral offset cored with a passage opening into the cup, a soft plug seated in the bottom of the latter above said passage, a fine pipe connected with the other end of such passage and adapted to be led to the outlet of a water closet cistern, and means for opening said valve by raising its head a slight distance above said nipple.



150,824. Float Valve.

2. In a valve of the class described the combination with a valve body having an upright nipple rising therefrom and lugs also rising vertically therefrom at opposite sides of the nipple, a lever pivoted between its ends to one lug and having a knob at its inner extremity, and means for raising and lowering the outer end of said lever, of a cup-shaped valve head whose shell surrounds said nipple and has a lateral offset cored with a passage opening into the cup, a hook rising from one side of said head and engaging said knob, an ear projecting rigidly from the other side of said head, means for detachably pivoting it to one of said lugs.



MONTREAL DELEGATES TO ANNUAL CONVENTION.

John A. Gordon, J. E. Walsh and John Watson have been appointed delegates from the Master Plumbers' Association of Montreal and Vicinity, to the convention of the Canadian Society of Sanitary Engineers, which meets in Ottawa June 9th, 10th and 11th.

* * *

A NEW PRICE-BOOK.

A very handy price list of plumbing supplies has been issued by the Master Plumbers' Association of Montreal and Vicinity. The price list is bound in morocco, with inner covers of celluloid. The book is made up in loose-leaf style, so that price changes may be made from time to time and the pages affected can be withdrawn and the new pages substituted. The price list, which is made up in pocket size, is very convenient and will no doubt prove a valuable aid to plumbers and steam-fitters.

* * *

CATALOGUES AND PRICE LISTS WANTED.

A disastrous fire occurred recently at the establishment of John Eggett & Co., 17 Dominion Loan Building, London, Ontario. We are asked to inform the various manufacturers and jobbers to forward catalogues, price lists and discount sheets to the above firm as soon as possible. We regret to learn of this occurrence, as not long ago we were informed that the firm were fairly busy, and for such a thing to happen at this period of the season when each and everyone are making bids for new business is anything but pleasant.

* * *

PLUMBERS' BANQUET AT WINDSOR.

The Journeymen Plumbers, Local No. 552, held their second annual banquet at the Cadillac club recently with the majority of the master plumbers in attendance. There were also several guests representing different wholesale houses who gave some very good addresses. A great deal of credit is due to the banquet committee, Thos. Matherson, Ross Flemington, S. Curtie, R. Hicks and Chris. Newitt, for the delightful evening that they furnished.

CHANGE IN BUSINESS.

The Fulton Hardware Co., of Salmon Arm, B.C., have disposed of the plumbing and heating business to A. H. Coulter, who was formerly in charge of the business on their behalf.

* * *

BUSINESS TRANSFER.

N. M. Walker, of Main street, Grimsby, has disposed of his entire stock and business of plumbing and tinsmithing to Messrs. Bird & Weiler, who will carry on the business from now on.

* * *

OPENED UP BUSINESS.

Messrs. L. Cook and F. O'Donoghue, two local young men, are opening up a plumbing establishment at 38 Erie street, Stratford, Ontario.

* * *

SUGGESTS INCREASED FEE.

That all the master plumbers in the city should be registered under the control of the Department of Health was the subject of a letter signed by John Wright on behalf of the licensed plumbers of the Domestic Sanitary and Heating Engineers.

They suggest that the license fee should be increased from \$1, as at present, to \$25 per year, and that every master plumber should be registered with the department, and that those who are not at present licensed should only receive them after passing an examination satisfactory to the authorized Examining Board.

Further, that no one should receive a license unless he is 25 years of age, and furnishes a bond of \$1,000 that he will not violate any rules or regulations of the by-laws respecting plumbing, drainage, sanitary matters, and waterworks.

In a memoranda accompanying the letter they answer several questions. They point that any interference with builders buying their supplies through wholesale houses would be a matter between the wholesalers and the builder, but the public would have to be safeguarded by the employment of a properly licensed master plumber or a qualified plumber holding a license, to carry out the plumbing by-law.

What It Would Do.

A higher license fee, they claim, would be an easier burden than if the plumbers had to pay for every transaction in the plumbing department, as is suggested by the by-law before Council.

The bond they consider a safeguard in order to enable the Medical Officer of Health to remedy any defective work, and they hold that the plumbing by-law would be more efficiently carried out, as they claim that many repairs and changes are made without permits being issued.

They point out further that last year the 500 licenses only brought \$500 and their proposition would create a revenue of \$12,500.

The matter was referred to Dr. Hastings to examine and report on to the Board of Health.—Toronto Star.

* * *

SANITARY INSPECTORS' ASSOCIATION.

The Sanitary Inspectors' Association of Western Canada held their Provincial Convention in Moose Jaw recently, which proved a great success. Several very interesting papers were read and about 20 inspectors were present. They will hold their annual convention in Winnipeg during the month of July, and active arrangements are being made to make this convention an epoch marking event in the history of municipal inspection in the Western provinces.

* * *

A WELCOME VISITOR.

Mr. H. H. McNamee, the worthy vice-president and treasurer of the Honeywell Heating Specialty Co., Wabash, Indiana, has been visiting several Canadian cities recently, and while in Toronto made a call upon Sanitary Engineer.

Speaking of the way the Canadian heating engineers were taking up the Honeywell generator, Mr. McNamee said their business with the Canadian trade had been all to be desired. They found that heating trade in the Province of Quebec, including Montreal, had been splendid buyers, and that they have the Honeywell heat generators taking care of hot water heating systems, ranging in

size from a few hundred feet to as high as 18,000 square feet of radiation in the Province of Quebec. Their next best fields are in the cities of the Western provinces. Mr. McNamee stated that their sales were far beyond their most sanguine expectations. Then in Ontario a fair amount of business had come their way, and that it was steadily increasing. Speaking of trade conditions in the West, Mr. McNamee said he thought the West had spent a little too much money on city building, and was experiencing a dullness which time alone would solve. He was very optimistic about conditions both in the West and generally throughout Canada, and said: "One thing, gentlemen, which I am pleased to note is the splendid national spirit of the Canadian people I have met. You are no longer a colonial people, but a nation, and one with a splendid future before you."

Those who had the pleasure of meeting Mr. McNamee must have felt they were in the presence of a man in every sense of the word, who represented a company who have and is doing great things in the heating business.

The writer well remembers the time engineers looked upon the Honeywell heat generators as a "white elephant," but time has shown that the Honeywell Heating Specialty Co. have made good all their claims, which in the heating business will be handed down in history.

BILL H. R. 14288.

(Continued from page 17.)

for it and in its stead, and charged with the duty of preparing such plans, specifications, and blue prints, which shall provide for the installation of plumbing and gasfitting, and all work kindred thereto, or of the steam and hot water heating, ventilating apparatus, steam-power plant and all work kindred thereto, shall, when the entire cost of the erection, alterations, or repairs of the plumbing and gas-fitting and all work kindred thereto, or the steam and hot water heating, ventilating apparatus, steam-power plant and all

work kindred thereto, or the electrical equipment and all work kindred thereto, is to exceed the sum of \$1,000, hereafter prepare separate plans, specifications, and blue prints for each of the following branches or classes of the work to be performed:

First.—Plumbing and gasfitting, and all work kindred thereto.

Second.—Steam and hot-water heating, ventilating apparatus, steam-power plant, and all work kindred thereto.

Third.—Electrical equipment, and all work kindred thereto.

Such plans, specifications, and blue prints must be so prepared and drawn as to permit separate and independent proposals and bids upon each of the branches or classes of work in the three above sub-divisions.

Sec. 2.—That every department, or board, or bureau, or commission, or body, or person charged with the duty of awarding or entering into contracts for the erection, alteration, or repair of any building in any state or territory or in the district of Columbia, by the United States, and every officer or person designated by such department or board, or bureau, or commission, or body to act for it and in its stead, and charged with the duty and duly empowered to award and enter into such contracts, which shall provide for the installation of plumbing and gasfitting and all work

kindred thereto, or the steam and hot water heating, ventilating apparatus, steam-power plant, and all work kindred thereto, or the electrical equipment and all work kindred thereto, shall, when the entire cost of the erection, alteration, or repair of the plumbing and gasfitting and all work kindred thereto, or the steam and hot water heating, ventilating apparatus, steam-power plant, and all work kindred thereto, or the electrical equipment and all work kindred thereto, is to exceed the sum of \$1,000, hereafter award the respective work specified in the sub-divisions mentioned in section one hereof separately to responsible and reliable individuals, firms, or corporations.

Sec. 3.—That all Acts and parts of Acts in conflict with the provisions of this Act are hereby repealed.

Sec. 4.—That this Act shall take effect and be in force on and after the 1st day of October, 1914.

Editorial Comments.

We in Canada who are engaged in the craft should take note of this bill and follow it up. We have the same difficulties to overcome as our brother craftsmen over the line. Such problems as are being dealt with in this bill are of a very vital nature, and the proper installation of such work should be enforced by some duly-constituted authority.



A scene during Montreal's water famine.

DON'T FORGET

The next Annual Convention of the Canadian Society of Domestic Sanitary and Heating Engineers will be held in Ottawa, June 9, 10, 11.

DEATH OF C. F. KULOW.

The death occurred recently at Pt. Colborne, Ont., of Carl F. Kulow, aged nineteen years, son of F. C. Kulow, dealer in stoves, tinware, plumbing, etc.



The late C. F. Kulow.

The late Mr. Kulow was associated in the business with his father, and had only been ill for nine days. Death resulted from appendicitis.

**Medicine Hat Radiators.**

L. Cary Wright, formerly of Sauk Centre, Minnesota, has taken out a permit for a building to cost \$35,000, which will house the manufacturing of radiators. Mr. Wright says that the factory will employ about 50 men when completed.

Wheeler and Bain Catalogue.

Wheeler & Bain, Toronto, have issued their annual Spring catalogue of galvanized iron, roofing supplies, eave-troughs, corrugated pipes and elbows, corrugated sheets, skylights, cornices, galvanized iron sheets, tin plates, etc. The catalogue consists of 56 pages and is neatly gotten up.

Injured in Auto Accident.

Wallace Cowan, sales manager Rice-Lewis & Sons, Toronto and W. R. Wight, a traveler for the Sheet Metal Products Co., were seriously injured when an auto in which they were riding skidded into a street car on College Street, Toronto. The motor car was badly smashed and the two men were taken out in an unconscious condition. Both were removed to the General Hospital, and reports indicate that their chances for recovery are good.

WANTED

FIRST-CLASS PLUMBER AND STEAMFITTER required. A good position for a man competent to check off plans and estimate on work. Reply, stating recommendations and salary wanted, to Box 243, Charlottetown. (1f)

NOTES OF THE COMING CONVENTION OF THE CANADIAN INSTITUTE OF SANITARY ENGINEERS WHICH WILL BE HELD IN EDMONTON MAY 4, 5 and 6.

Arrangements for business and entertainment in connection with the second annual convention of the Institute of Sanitary Engineers to be held May 4, 5, and 6, at Edmonton, Alta., have been completed, and soon after this copy of Sanitary Engineer is in the hands of western readers, the delegates will be assembled in the northern Alberta city discussing sanitary matters of vital interest to the whole West.

Copies have been received at headquarters of reports from the various branches on questions referred to them at the last convention held in Winnipeg, and some of them are very lengthy. These will be read at the convention, and are from Winnipeg, Saskatoon, Edmonton, Calgary, and other centres. At the time of going to press, arrangements were being made to run a special car of delegates from Winnipeg, and large numbers were arranging to travel to Edmonton from Saskatoon, Calgary, and many of the other Western cities, while the sanitary engineers from Edmonton will, of course, be there in full force.

The subjects to be discussed at the convention were left over at the Winnipeg convention, and it is expected there will be hot discussion, particularly over the questions of "standardization of soil pipe and fittings," "examination of plumbers," and "size of soil, waste and vent pipes." Although these questions proved contentious at the last convention, the feeling is that a decision will be reached at Edmonton, when arrangements will be made with the various provincial governments for a uniform plumbing by-law.

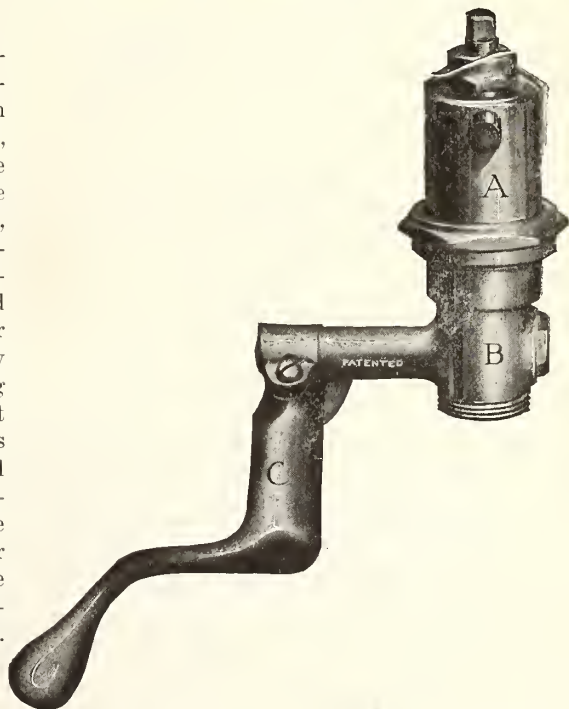
Business begins at 10 o'clock on the morning of May 4. Entertainment has been provided as follows: Monday, May 4, 12-2, Luncheon, the delegates being guests of the City of Edmonton. On the same evening at 8.30, there will be a theatre party, ladies invited, when delegates will be guests of the Edmonton Society of Domestic, Sanitary and Heating Engineers.

On Tuesday, May 5, in the afternoon, from 1 to 3, there will be an auto drive, the party being guests of the Edmonton Industrial Association. In the evening the local members will entertain the delegates to a smoker.

On Wednesday, May 6, there will be a banquet in the evening at 8.30, delegates being guests of local manufacturers and supply houses. The headquarters of the convention will be the Empire Hotel, and the sessions will be held in the Empire Auditorium, on Second Street.

The entertainment committee consists of the following: H. Nash, (chairman), C. R. Frost, F. McLean, J. M. Holt, and C. Richardson.

Still another new invention for sanitary engineers. The Canadian Wolverine Company, Ltd., Chatham, have put on the market a most simple and effective flushometer, which is clear of all wearing parts of a complicated nature; can be used for direct pressure or gravity systems. They make some very strong claims for this article. It is well gotten up, and is backed by unconditional guarantee. Those interested in such a fixture would do well to write for full particulars to the Canadian Wolverine Company, Ltd., Chatham, Ont.



Victoria, B. C.—The Modern Plumbing & Heating Co. has been succeeded by the Western Plumbing and Heating Co.

Problems in Sheet Metal Work

IN our April 15 issue we partially developed the pattern necessary for a roof flange, showing the various stages necessary to follow out in the development of such a pattern, and had progressed so far as to have described Figs. 2, 3, 4, 5 and 6. We will now describe the actual full pattern shown in Fig. 7.

First erect a vertical dotted line shown in Fig. 3, B.X.I. elevation and same length as B.X.I., though giving this pattern the same letters and figures as shown in Fig. 4, viz., the vertical dotted line in Fig. 7 describes g.l. then transfer the length from centre g, Fig. 4, to g. b.d., Fig. 7, and erect dotted lines as shown from b.d. to l.

Next take compasses and describe arcs 1, 2, 3, 4 formed by using centre k in Fig. 6, and transferring to b., Fig. 7, then use stretchout measurements in circle on plan Fig. 4, and intersect the arcs 1, 2, 3, 4 in Fig. 7.

Next place the compass at l., Fig. 5, and open up to 4, then with that measurement from an arc at a., Fig. 7.

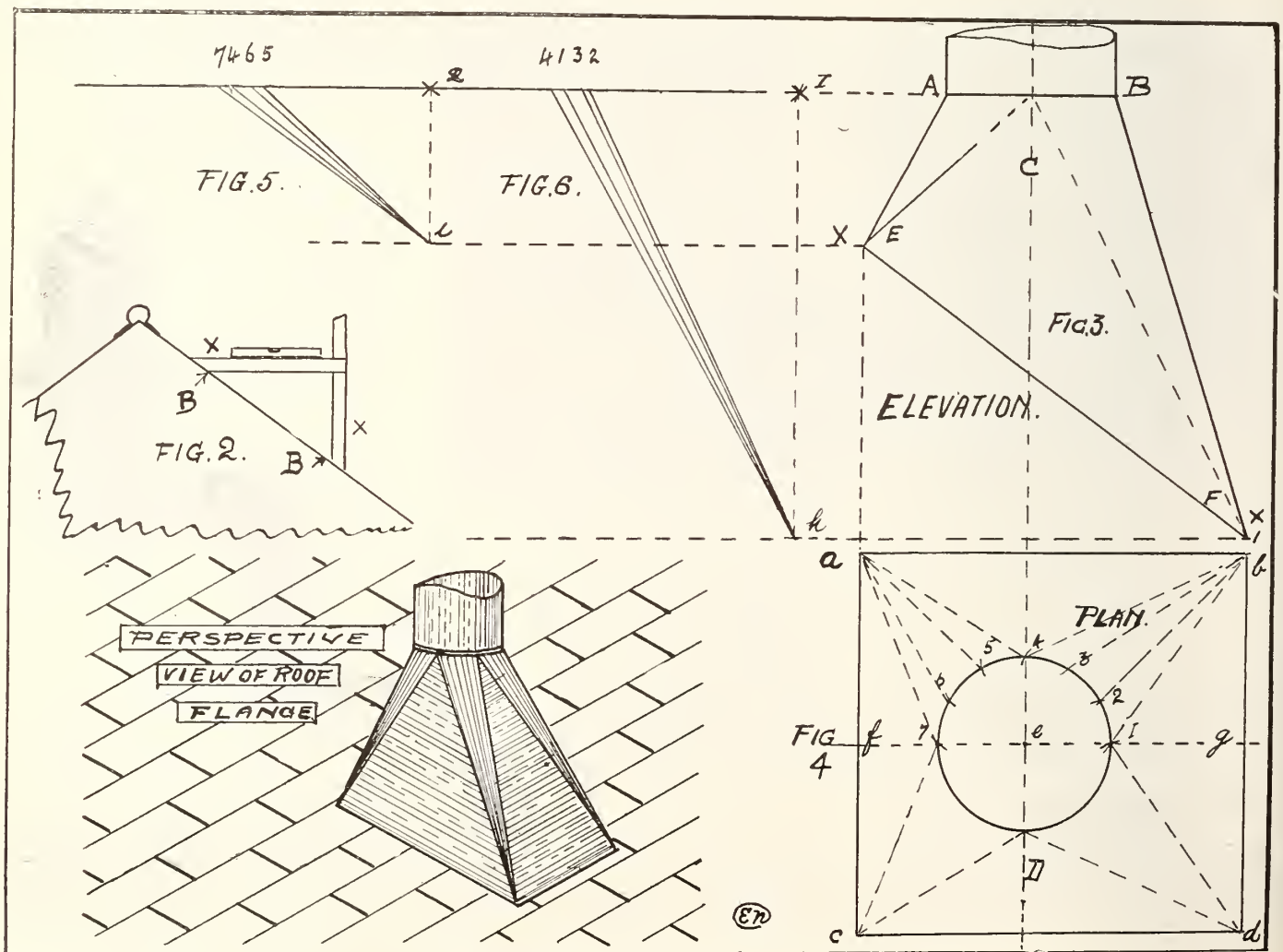
Next place the compass point at F. and open up to E., this measurement is used to intersect the arc 4.a., now draw the dotted line shown at 4.a. Next transfer the various distances shown from i. 4, 5, 6, 7 in Fig. 5, by placing compass point at a., Fig. 7. Again intersecting these arcs by the measurements found at f., 4, 5, 6, 7 in plan Fig. 7, then by placing compass point at f., Fig. 4, opening up at a. or e., and transferring the distance to a. in Fig. 7, making arc, then placing compass point at E.A., Fig. 3, transfer this measurement to f.7, intersecting arc f. in Fig. 7. Next draw the various solid lines as shown, this finishes the half pattern, the other half may be developed by simply turning the half pattern over at g.l, which will give the results shown, the outer dotted lines are necessary to fasten flange on roof and should be wider than shown. It may be stated that this pattern is always best made in one piece, though only one half-pattern is really necessary. In our next issue we will describe the easiest way to

develop the necessary pieces to make up a roof hopper, which are very desirable on flat roofs.

ELECTRIC FLASHLIGHTS.

There is a rapidly growing demand for electric flashlights, and hardware dealers can do both themselves and their customers a good turn by carrying them in stock. Naturally, this idea carries with it featuring them in the show windows and in newspaper ads.

Automobilists have probably created the demand, but many others are finding them exceedingly useful and convenient to carry, and they may easily be handled with perfect safety in barns and other places where any other kind of light would be dangerous. Lanterns will always be in demand, of course, and are staple hardware stock, but the electric flashlight, if displayed and explained, will find many purchasers in any community.—Implement Journal.



SAFETY FIRST.

The new industrial slogan, "Safety First" has been utilized for advertising purposes by the L. S. Starrett Co. in a unique manner. They have had prepared celluloid buttons bearing the solid red circular sign of the Safety First movement above which are the words, "Safety First," while under the emblem are the words, "Then Starrett Tools." The idea is that the first thing should be safety—then accuracy—and as they claim, Starrett Tools stand for accuracy.



Button issued by L. S. Starrett Co.

These buttons are supplied to hardware dealers for distribution to mechanics; or to manufacturers for direct use by their men.

**PERSISTENCY IN ADVERTISING.**

One stroke of a bell in a thick fog does not give any lasting impression of its location, but when followed by repeated strokes at regular intervals the

densest fog or the darkest night can not long conceal its whereabouts. Likewise a single insertion of an advertisement—as compared with regular and

systematic advertising—is in its effect not unlike a sound which, heard but faintly once, is lost in space and soon forgot.—Printing Art.

NEW ASSOCIATION FORMED.

It is interesting to know that members of the craft are becoming more united, the latest to form an association are those of the Okanagan Valley, B.C. The following is a letter to the Editor:

PRESIDENT: D. LECKIE.

SEC.-TREAS., D. J. MORGAN.

VICE-PRES. J. E. ROSS.

OKANAGAN ASSOCIATION OF HEATING AND SANITARY ENGINEERS.

Penticton, B.C., April 23, '14.

Editor Sanitary Engineer,
Dear Sir,—

I take great pleasure in informing you that we, the plumbers and steamfitters of the Okanagan Valley, B.C., have organized an association.

We aim to advance the conditions of the trade generally in our territory and also get better acquainted with one another.

We had our first meeting on the 15th inst., and elected officers for the ensuing year. Our meeting was made up of representatives from seven firms and three other local firms have promised their support at our next meeting. There are eleven firms doing business in this valley and we expect to have a good association in a short time.

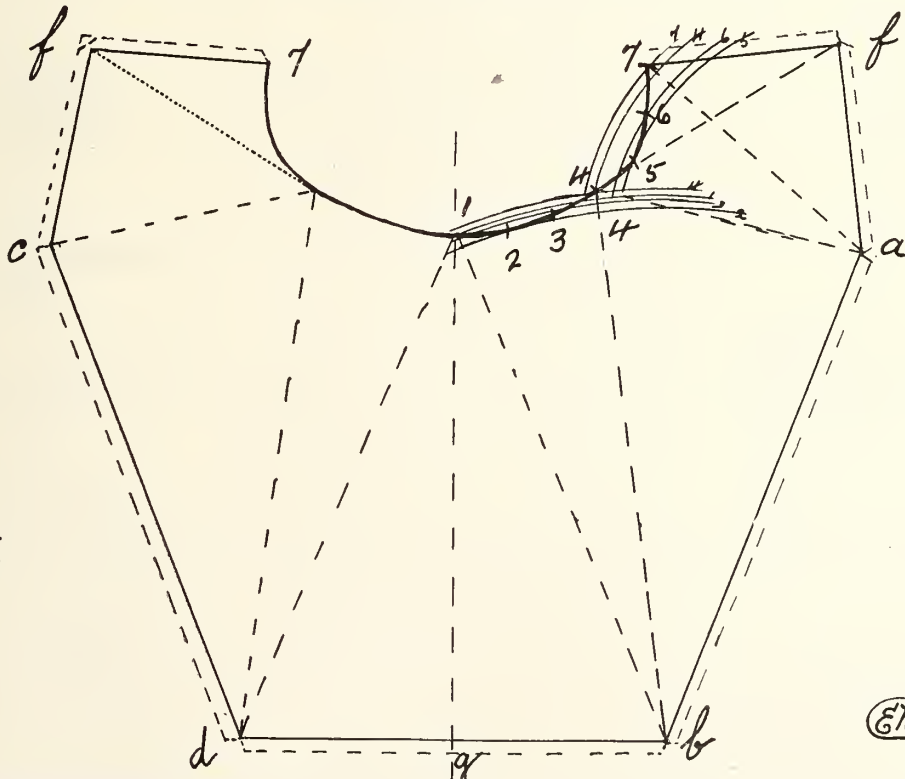
Yours Truly,

D. J. MORGAN,

Secretary-Treasurer.

FULL PATTERN OF ROOF FLANGE.

SHOWN IN PERSPECTIVE VIEW.

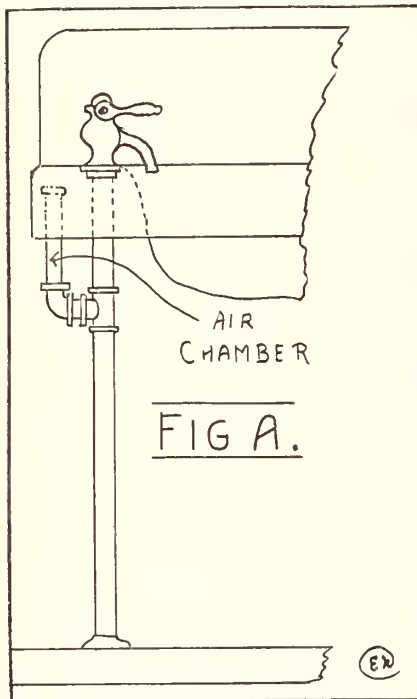




Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

TRoubLED WITH WATER HAMMER.

Editor Sanitary Engineer.—I have just connected several houses up to a new city water supply main, and in the first place, the houses had their own pump and cisterns in the attics; the watercocks are all Fuller style; they



Air chamber made of pipe and capped on lavatory supply pipe.

make a terrible noise now when they are closed. Can you please tell me the trouble, as I am blamed for doing something wrong to the water service pipes? Can you tell me the cause and a way to overcome the trouble?

Constant Reader.

Replying to "Constant Reader," may say the noise he speaks of is known as "water hammer," and is caused by the quick closing action of the Fuller cocks and the pressure behind them. The noise would not be experienced under the first condition, because the source of

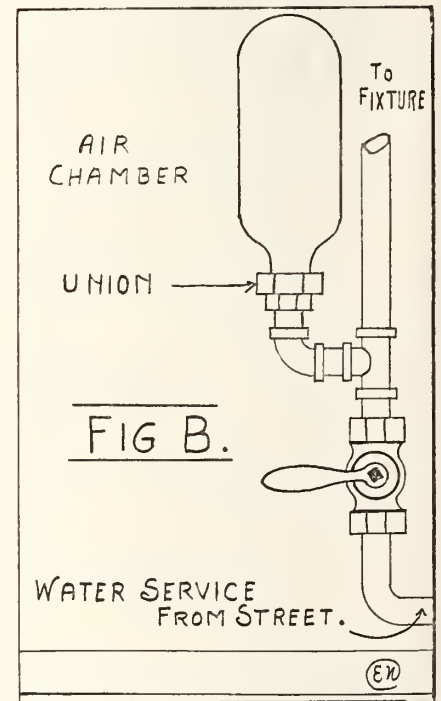
water would be more elastic, being open at the tank. Now it will be seen there is a city pressure against the cocks, which makes the noise when they are operated. "Constant Reader" is in no way to blame for the trouble which has developed. There are several ways to overcome the trouble: First, either change all the taps for a slightly slower action; second, place air chambers on each supply pipe as near the tap as it is possible, as shown in Fig. A, or place a good-sized air chamber on the main supply, near to the stop-cock, as shown in Fig. B.—Editor.



PUTTING FOUR-INCH FLANGE ON TUBULAR BOILER.

Editor Sanitary Engineer. — I read with interest your article in the Feb. issue on refuelling a tubular boiler, and as I consider the more fitters know about tubular boilers the better for the trade, I am going to describe a little job we did on a boiler this fall. We had cause to use for heating a boiler taken from a power plant. The lower opening was only one and one-quarter inch. We required a four-inch opening, hence the problem. I procured a four-inch steel flange made to fit the round of the boiler, eight three-quarter inch patch bolts and a sheet of copper 1-16th inch thick and large enough to cut a gasket the full size of the flange. I first drilled the flange and counter-sunk it to fit the patch bolts, then laid it in place on to the boiler and scribed both inside and outside circumference on the steel. For this I used a piece of pointed brass wire which leaves a very nice mark on dark iron or steel. On the inside line I drilled half-inch holes at one-inch centres; when the circle was completed I chipped away the pieces between the holes and removed the centre again I laid my flange in place and scribed the eight bolt holes carefully marking the flange before I took it off so

I should be sure to get it on the same way next time. Now I drilled the holes five-eighths and tapped them twelve threads to the inch so that the bolts fitted nice and snug. From my copper I cut a nice gasket the full size of the flange, placed this on the boiler and the flange on top and entered all the bolts; these I



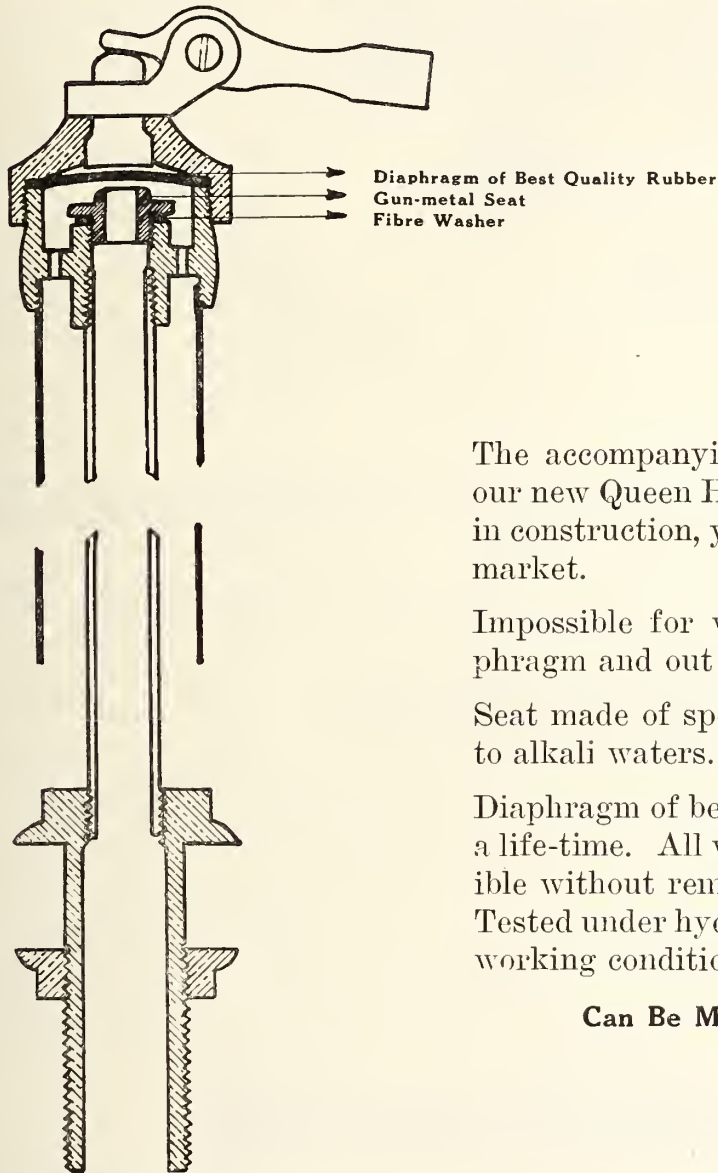
Air chamber on water service where it enters the building.

tightened a few threads, each in rotation until they were all fairly tight hammering the flange to the boiler as I drew on the bolts.

When the flange looked good I took a caulking iron and caulked the edge tight to the boiler plate all round the outside, then cut the square head off the bolts and caulked them down till they looked like a part of the flange. When we filled the boiler it was perfectly tight and the boiler inspector said we had a first-class job.

J. W. R.
Portage La Prairie.

EMPIRE QUEEN BALL-COCK



The accompanying cut shows a section of our new Queen High-Up Ball Cock. Simple in construction, yet the **Best** ball cock on the market.

Impossible for water to get past the diaphragm and out the plunger.

Seat made of special gun-metal impervious to alkali waters.

Diaphragm of best quality rubber—will last a life-time. All working parts easily accessible without removing ball cock from tank. Tested under hydraulic pressure as in actual working conditions.

Can Be Made for High Pressure

Patents Pending

EMPIRE MANUFACTURING CO., LIMITED

LONDON, CANADA

MANUFACTURERS OF AND DEALERS IN
PLUMBERS' AND STEAMFITTERS' SUPPLIES OF ALL KINDS

Plumbing and Heating Markets

THE PLUMBING AND HEATING MARKET IN MONTREAL.

Montreal, April 24.—While business generally is a little quiet at this time, there does not seem to be any disposition by members of the craft to view the outlook with alarm. In fact, there is an inclination to look hopefully to the future and to await the completion of a number of big undertakings, which will lead to quite a marked activity in the installation of sanitary appliances. There is a fair amount of spring jobbing at the present time, and the majority of the plumbers seem to be kept pretty busy just now with repair work. There is always a large amount of work of this kind at this season of the year, when tenants are moving from one place to another. Landlords seem to have a habit of awaiting the departure of one tenant and the arrival of another before making repairs that oftentimes should have been made long before. This sometimes makes it awkward for the plumbers, as they have many calls to attend to in order to try and satisfy the many householders, who all want their work done at once. Several large office buildings and a number of Governmental structures are under construction at the present time and, as these near completion, the sanitary experts will be able to perform their part of the work.

Enamelware.

The market is quiet at the present time, and there has been very little movement. All lines are moving slowly, and there does not appear to be much prospect of a change for a while at least.

Brass Goods.

The demand is about as usual, with fairly good stocks on hand. It is possible that the new tariff may affect prices, but up to the present the manufacturers have made no move in this direction.

Black and Galvanized Pipe.

There was some talk of a new price list on account of the increased tariff, and it appeared so certain that prices would change that some jobbers withdrew quotations on some sizes altogether for a few days. On account of the quiet market, however, the quotations have been restored, and it is not likely that any change will be made until the market strengthens. As for pipe fittings, there is little to be said, since demand is largely governed by the sale of pipe.

Soil Pipe and Fittings.

There has been little change in the demand yet, but it is expected that with the progress of the building work the sales will increase. A lot of small buildings are projected on account of the

scarcity of houses, and in many cases the ground for the new structures is just being broken.

Lead and Lead Pipe.

There is an unsettled feeling in the market at the present time, owing to the Mexican developments. The market is in such a state that almost anything may be looked for. Prices on lead were marked down 25 cents last week, but it is anticipated that should the war with Mexico develop, lead, which enters so largely into war materials, will be scarcer, and prices consequently will rise.

Solder.

This market is quiet and prices are unchanged.

Collections.

While there has been some improvement in collections within the past week or two, there is still much to be desired. The cold, backward weather, it is felt, is responsible in some degree for the continuation of the unsatisfactory conditions, and with the advent of warmer weather, so that the general spring business can commence, it is expected that business generally will begin to show improvement.

TORONTO MARKETS.

No doubt as a whole business is not quite what could be desired. Some shops report business good, while others are not. It is felt that the backward spring is a partial cause, though last year's financial stringency is the real trouble, which time alone can cope with. Those who contract for small house work will get the business this coming year, for the simple reason that in large cities there has been too much overcrowding. Then the increased population which immigration will add will have to be housed, and before the winter sets in, too. Therefore it is felt that such building operations which do take place will not be large factory or office buildings, but rather of a residential nature.

Enamelware.

Factories report none too busy; there will not be any particular demand until some of the buildings now under construction are nearer completion. There is, however, a little movement in enamelware, which is chiefly improvements which are being made for incoming tenants.

Brass Goods.

No great demands are being made at the time of writing, though a higher grade of goods are being called for. Customers are finding that repairs are expensive, and that it pays best to buy higher grade goods.

Black and Galvanized Iron Pipe.

While it was rumored that a change in prices may take place on account of the increased tariff, it is felt that until demands are brisker such will not be the case.

Soil Pipe and Fittings.

Demands are very normal just now, and no rush is expected until building operations open up a little. Builders find money still a little scarce, which is to a certain extent retarding building operations. It is felt that more residential property will go up in the near future than larger buildings.

Lead Pipe and Traps.

No price changes are reported since our last issue, though there is a tendency to drop a little in the near future, though opening up of building operations will cause a firmness in this line.



THE DAY OF EXPLANATION.

(Continued from Page 20.)

that was fair and legitimate, and invited anybody who might be interested to come in and talk it over.

The public to-day is curious. Some business men shrink from investigation. Even though they may have nothing to conceal, there is a vague fear of exposing trade secrets and confidential business details. The far-seeing business man, however, in tune with the spirit of to-day, utilizes this public curiosity. He understands that the world has become rather complicated and that people want to know details. He finds that a plain statement of technical facts, devoid of special plea or advertising motive, often enables the public to facilitate management, even though it be by nothing more than good will.

Moreover, confession seems to be as good for the soul in business as in morals. The business man finds that an explanation is of little value unless the explainer steps over and sees things from the other fellow's viewpoint, and that it also involves a careful examination of his own side of the case—maybe more careful than he has ever given it.

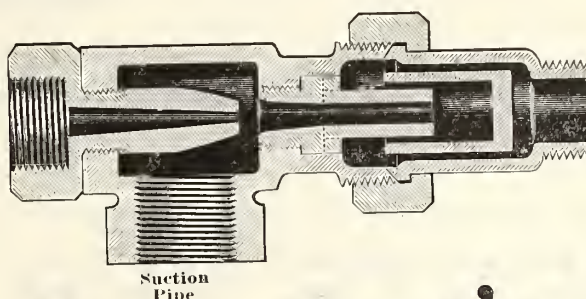
As a technical writer put it recently, the corporation manager who sits down and tries to write out a clear statement, setting forth his side of a controversy with the public, is pretty certain to learn a great many things about the other side of the question that would never have come to his notice in the ordinary course of events.

Furthermore, as he strengthens his case on paper he unconsciously looks for and corrects mistakes in management that have helped to lead to the very state of public opinion he is trying to change.

Save one

The Morrison Water Jet Lifter is a money-saver you can not afford to be without. Full particulars sent on request.

City
Water
Supply



Discharge

The Ultimate Pump

The Morrison Water Jet Lifter is the simplest, cheapest and yet practical and reliable pump ever offered to the plumbing trade. It is used for draining flooded cellars, excavations, or any accumulation of water. It is self-priming, and requires no labor to operate it. Pumps hot or cold, clear or muddy water, to any lift up to thirty feet.

It is absolutely fool-proof, works anywhere in any position. All that is necessary is a city water service to supply it.

The
**James Morrison
Brass Mfg. Co., Ltd.**

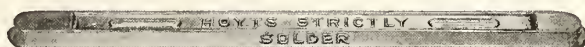
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TORONTO

CANADA

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Our Mixed Metal Sales Amount to Over \$5,000,000 Annually



THE RESULT OF QUALITY

Babbitt Metal, Bar Solder, Wire Solder, Lead Pipe, Bar Lead, Traps, Bends, Copper, Tin and Antimony.

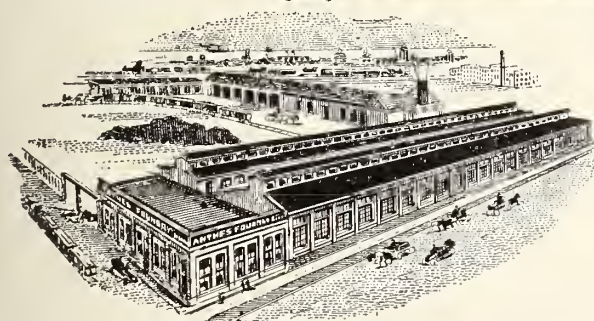
Let the goods prove their worthiness of a place in your stock. Send a trial order.

Hoyt Metal Co.,

New York, N. Y.; London, Eng.; St. Louis, Mo.

Toronto, Ont.

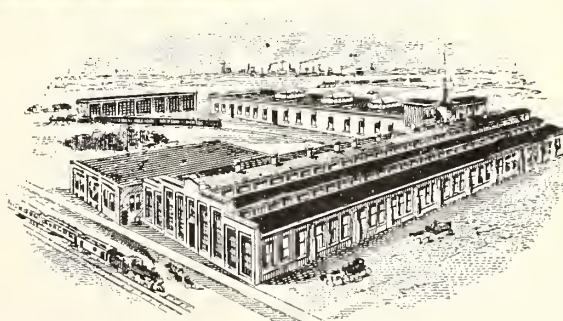
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ANTHES FOUNDRY LIMITED

WINNIPEG

MANUFACTURERS
OF
**CAST IRON
SOIL PIPE
AND
FITTINGS**



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LEAD PIPE LEAD WASTE



BLOCK TIN PIPE

The Canada Metal Co., Ltd.,

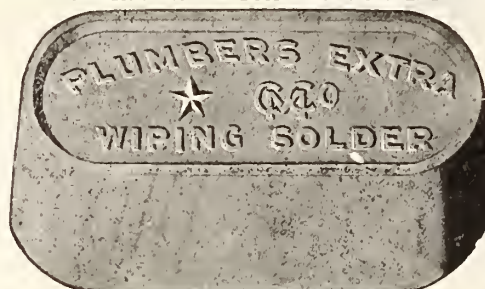
Head Office
and Factory.

TORONTO

WE MANUFACTURE
FOR THE PLUMBER

Lead Pipe Lead Waste
Hydraulic Drawn Traps
Non-Syphon Centrifugal Cast
Trap (Ask for Cut or Price).
Strictly Bar Solder
Star Extra Wiping (Best on
Earth)
Easy Wiping Solder
Acme Wiping
Brass Ferrules (Select) Tinned
Iron and Lead Combination
Ferrule Bends or Spun End Test
Sheet Lead Lead Fibre

PLUMBER'S EXTRA STAR WIPING SOLDER



THE SOLDER WITH THE TIN IN

Branch
Factories

MONTREAL, WINNIPEG

TWO CENTS PER WORD

with a Want Ad. in this paper.

You can talk across the continent for two cents per word

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The index is inserted solely for the convenience of the readers of the paper.

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Prosperity Rampant In the Peace River

Climatologists have figured out that a thousand feet reduction in altitude is equivalent to between three hundred and three hundred and fifty miles of latitude. Calgary district is about three thousand feet above sea level, Edmonton a little over two thousand; Dunvegan, on the Peace, is thirteen hundred, and Fort Vermilion, farther down the river, is only nine hundred and fifty.

These figures, considered along with the tempering influence of the warm Japan current, whose soft breath is wafted across the Rocky Mountain range on the wings of the far-famed Chinook, go to explain the miracles of production now heard of from what was once supposed to be the frozen and forbidding North.

So writes in the May MacLean's, W. D. Albright, a brilliant young journalist-farmer, now 800 miles north-west of Edmonton. On the ground, about which he talks, he is authoritative and convincing. The producing agents are getting down to business. Their assumption of such operations means a speedy return to business progress. Read this striking description of the third chapter in Western growth.

Then again the May issue of MacLean's is unusually bright by reason of the excellence of:

Canadians at Harvard. By H. G. Black.
John McClary—Still At It. By W. A. Craick.
The Business Outlook. By Jno. Appleton.
The Princess of the Stage. By Margaret Bell.
An Automobile Sprite. By B. B. Cooke.
The German Electric Genius. By F. W. Wile.
And the Five Entertaining Short Stories.
By Sullivan, Cooke, Pinkerton, Rorke, and Quarren.

The Coburn cover design for this month will appeal to every lover of Canadian art.

Send us a postcard and have your name placed on our subscription list.

Subscription \$2.00 a year.

Twenty cents a copy.

WRITE DEPARTMENT M.

The MacLean Publishing Co.
LIMITED

143-149 University Avenue, Toronto, Canada

"Agrippa"

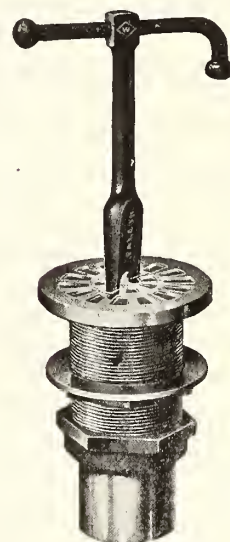
Chain Wrenches



Universal for Pipe and Fittings

A life may depend upon or an injury may result from the use of most tools. "AGRIPPA" Chain Pipe Wrenches are tested and proved dependable before they reach you. This practice is unknown elsewhere—every weakness is eliminated.

"AGRIPPA" Wrenches will do all of your pipe and fittings work and are guaranteed to do it without a failure—and at the minimum of cost.



Show us a plug which a Williams Waste Plug Spanner will not fit.

J.H. Williams & Co.

Superior Drop-forged Tools

77 Richards St., Brooklyn, N.Y. City
40 So. Clinton St., Chicago, Ill.

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What Do You Earn?

Don't think us impertinent. We want you to put the question to yourself, and to supplement it with the further question, "Could you earn any more?"

Certainly you could, if your wasted evenings could be used to advantage.

Why not let The MacLean Publishing Company help you out? They will appoint you circulation solicitor in your district for MacLean's Magazine.

When you have tried it you may find it pays you well enough to give your whole time to it. That has been the experience of many before you.

The MacLean Pub. Co.
143-149 University Ave.
TORONTO

Condensed or "Want" Ads.

FOR SALE

FIRST-CLASS PLUMBING AND PUMP business in a town about 2,000, doing a good trade, water works just installed last summer and a good business is being done. An A1 business for a first-class plumber, stock about \$800.00. Good reasons for selling. Address Box 73, Fergus, Ont. (9)

TECHNICAL BOOKS

DOMESTIC ELECTRICAL WORK BY WILLIAM A. WITTBECKER. Concise and Practical Explanation for Sanitary Engineers on How to Wire Buildings for Bells, Alarms, Annunciators, and for Gas Lighting from Batteries. The information given is practical, and with a close observance of the directions laid down, any one, though entirely ignorant of electricity, should be able to do the work described. Illustrated with 22 diagrams. Price, in paper, 25c postpaid. Price, in cloth, 50c. MacLean Pub. Co., 143 University Avenue, Toronto.

VACUUM CLEANING SYSTEMS, BY M. S. COOLEY. A fine and authoritative treatise on the art of vacuum cleaning. Contains all the author's tests of vacuum-cleaning apparatus, history of mechanical cleaning, requirements of an ideal vacuum cleaning system, also chapters on carpet renovation, vacuum producers, separators, hose, fittings, etc. 244 pages, 6 x 9 inches; 105 illustrations, 20 tables. Price postpaid, \$3.15. MacLean Publishing Co., 143-149 University Ave., Toronto.

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93 St. Genevieve Street, Montreal



GENUINE ARMSTRONG STOCKS and DIES

FOR THREADING PIPE OR BOLTS

KNOWN, USED,
COMMENDED EVERYWHERE

PIPE MACHINES,

both Hand or Power

HINGED PIPE VISES

PIPE CUTTERS

PIPE WRENCHES

RATCHET ATTACHMENTS

BARD ADJUSTABLE

BUSHINGS

Manufactured by

**THE ARMSTRONG M'F'G.
CO.**

317 Knowlton St.

BRIDGEPORT, CONN., U.S.A.
NEW YORK CHICAGO

WRITE FOR CATALOG

Education an Investment

The Anglo-American Sanitary Correspondence College

(A SCHOOL FOR PLUMBERS CONDUCTED BY PLUMBERS)

TEACH IN YOUR OWN HOME

—Course A—

THE THEORY AND SCIENCE OF PLUMBING

A course to train apprentices and helpers in the technical part of their business and enable them to pass their examinations when proficient.

—Course B—

SANITARY SCIENCE AND ENGINEERING

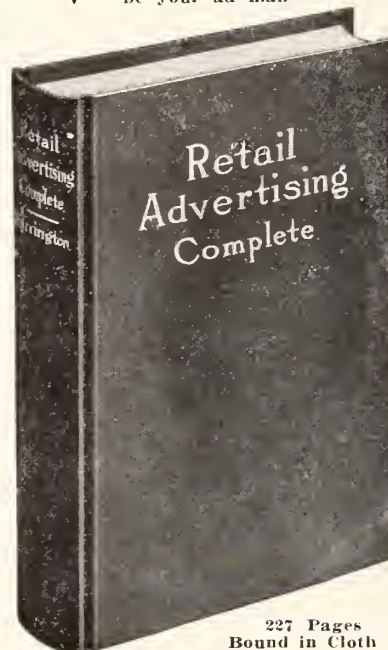
Preparing proficient plumbers for the positions of Sanitary and Plumbing Inspectors.

Director—Professor Arthur Bateman, who has been a practical teacher for eleven years, in four different institutions, in two countries. *Booklet and full particulars free to the Plumbing Fraternity. Write—Desk 2 10-12W.*

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227 Pages
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This new book on advertising will tell you all you want to know about advertising in the store.

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Forwarded direct, postpaid, on receipt of price. Keep the book a week, and if it is not

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Asbestos Goods.
Can. Johns-Manville Co., Toronto.
Air Line Systems.
C. A. Dunham & Co., Ltd., Toronto.
National Steam Specialty Co., Chicago.

Aluminum Casting.
Tallman Brass & Metal Co., Hamilton.
Canada Metal Co., Toronto.

Brass Castings.
Tallman Brass & Metal Co., Hamilton.
James Morrison Brass Mfg. Co., Toronto.

Brass Goods, Valves, Etc.
James Morrison Brass Mfg. Co., Toronto.
Wallaceburg Brass Mfg. Co., Wallaceburg, Ont.
Empire Brass Mfg. Co., London.
Dunham, C. A., Toronto.

Brass Pipe and Tube.
Empire Brass Mfg. Co., Toronto.
Tallman Brass & Metal Co., Hamilton.
Canada Metal Co., Toronto.

Boilers, Steam or Hot Water.
Warden, King, Ltd., Montreal.
Steel & Radiation, Toronto.
Pease Foundry Co., Ltd., Toronto.

Burners.
Standard Heating & Radiator Co., Pittsburgh, Pa.

Correspondence Schools.
Anglo-American Sanitary School.

Country Residence Equipments.
National Equipment Co., Toronto.

Chicago Pump Co., Chicago.
Leader Iron Works, Chicago.

Closets.
Empire Brass Mfg. Co., London.
James Morrison Brass Mfg. Co., Toronto.

Galt Brass Co., Galt.
Amherst Foundry Co., Amherst, N.S.
Johns-Manville Co., Toronto.

Drainage Fittings.
Fittings, Limited, Oshawa.
Warden, King, Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Empire Brass Mfg. Co., Ltd., London

Ejectors, Steam.
James Morrison Brass Mfg. Co., Toronto.
Kerr Engine Co., Walkerville.
Tallman Brass & Metal Co., Hamilton.

Ejectors for Sewage.
Chicago Pump Co., Chicago.
Thomas & Smith, Chicago.
National Equipment Co., Toronto.

Fittings.
Fittings, Limited, Oshawa.
Steel & Radiation, Ltd., Toronto.
Warden, King, Ltd., Montreal.
James Morrison Brass Mfg. Co., Toronto.

Empire Brass Mfg. Co., London.
National Steam Specialty Co., Chicago

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Honeywell Heating Specialty Co., Montreal.
James Morrison Brass Mfg. Co., Toronto.
National Steam Specialty Co., Chicago.

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Warden, King, Ltd., Montreal.
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Pease Foundry Co., Ltd., Toronto.

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Machinery Pipe Threading.
Hall & Sons, Ltd., Brantford.

Nipples.
Canadian Tube & Iron Co., Ltd., Montreal.

Warden, King, Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Canada Metal Co., Ltd., Toronto.
Galt Brass Co., Galt.

Canadian Brass Co., Galt.
Empire Brass Mfg. Co., Ltd., London.
Wallaceburg Brass Mfg. Co., Wallaceburg.

Canadian Wolverine Co., Ltd., Chatham.
James Morrison Brass Mfg. Co., Toronto.

Packing.
Canadian Johns-Manville Co., Ltd., Toronto.

Pipe, Black and Galvanized.
Canadian Tube & Iron Co., Ltd., Montreal.

Steel & Radiation, Ltd., Toronto.
Warden, King, Ltd., Montreal.

Pipe Joint Compounds.
National Steam Specialty Co., Chicago.

Pipe, Soil, and Fittings.
Empire Brass Mfg. Co., London.
Galt Brass Mfg. Co., Galt.

Pumps.
Leader Iron Works, Chicago.
Chicago Pump Co., Chicago.
C. A. Dunham & Co., Ltd., Toronto.
National Equipment Co., Toronto.
Thomas & Smith, Inc., Chicago.

Radiator Fittings.
National Steam Specialty Co., Chicago.

Radiators.
Warden, King, Ltd., Montreal.
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C. A. Dunham & Co., Ltd., Toronto.

Steam Specialties.
Dunham, C. A., Co., Toronto.

Mouat-Squires Co., Cleveland.
Honeywell Heating Specialty Co., Montreal.

National Steam Specialty Co., Chicago.
Kerr Engine Co., Walkerville, Ont.
The E. S. Manny Co., Montreal.
Dart Union Co., Ltd., Toronto.

Tools.
Canadian Tap & Die Co., Ltd.
Borden-Canadian Co., Toronto.

Nye Die, Tool & Machine Co., Chicago.

Hall & Sons, Ltd., Brantford.
Armstrong Mfg. Co. Bridgeport, U.S.A.

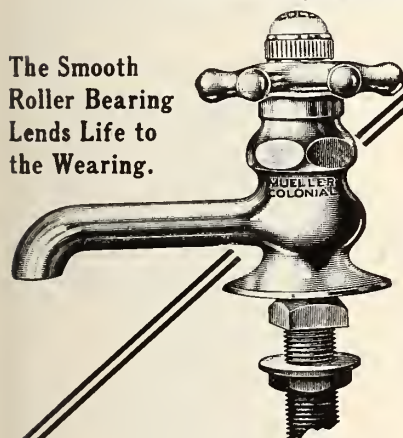
Williams, J. H., & Co., Brooklyn, N.Y.

Unions.
Dart Union Co., Ltd., Toronto.

Vacuum Systems of Heating.
C. A. Dunham & Co., Ltd., Toronto.

Mueller
Self-Closing Basin Cock

The Smooth
Roller Bearing
Lends Life to
the Wearing.



B-12902

Size Up This Cock, Beauty, Isn't It?

But no illustration will do it justice. You must see and know the cock with its perfect lines and curves, its perfect mechanism and its wonderful wearing qualities.

Mueller Colonial Self-Closing Work

Is simply a perfect piece of plumbing goods in metal, in mechanism, in workmanship and in service. That's where it shines—in service—cutting down water waste and saving the user money. And it has the wearing qualities. Give it a trial. Let the goods prove what we claim.

Tested
200 lbs. Hydraulic
Pressure

Mueller

And
Unconditionally
Guaranteed

Plumbing
Brass Goods

MADE IN CANADA

H. Mueller Mfg. Co. Ltd.
SARNIA, ONTARIO

S.E.

**H. Mueller
Mfg. Co. Ltd.**
SARNIA, ONT.

Send me catalogue
and prices on Mueller
Self-Closing Work.

Signed

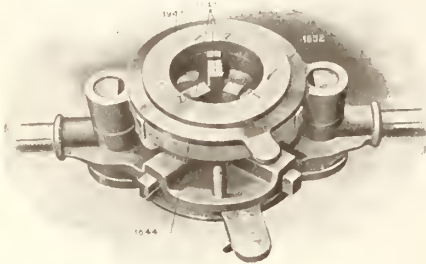
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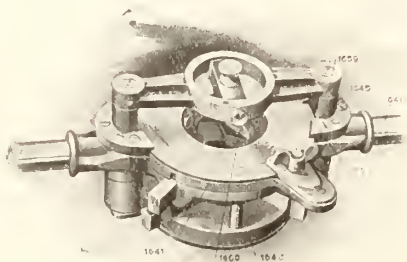
MUCH TIME AND LABOR
CAN BE SAVED!

Use the

"PREMIER" Die Stock



Rear View of Die Stock



Die Stock Open



Two Dies in One

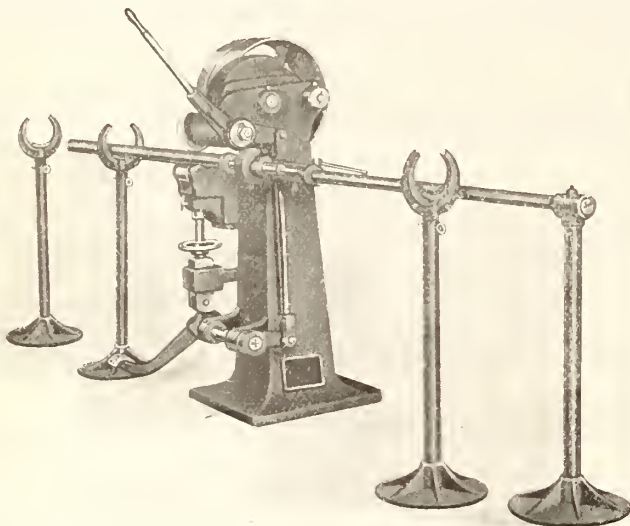
It threads 1 to 2 inch Right and 1 to 2 inch Left with one set of dies. It starts itself on the pipe, also throws itself out after a "Briggs" Standard Thread is cut instead of backing off, which spoils the dies. No loose bushings to carry around to lose. The New Patented Off-Set Die, which can be used only in the "Premier," does away with leader screws and nuts—and much trouble.

The Die is made in such a way that it accomplishes by going over the pipe once what any other make of die would do in going over twice. The "Premier" Die Stock can be easily operated by a novice.

Give it a trial. If not satisfactory, ship it back at our expense.

Write for full particulars.

BORDEN-CANADIAN COMPANY
TORONTO - ONTARIO



The Hall No. 2 Rapid Upright Roller Pipe Cutter for Rapid Work and a Clean Cut

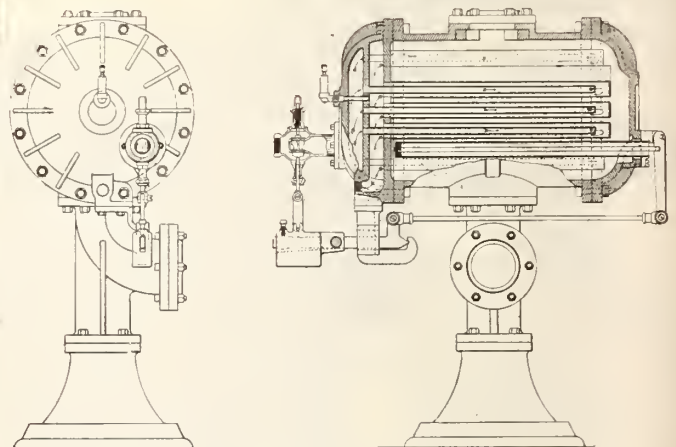
By repeated tests this machine has proven the most efficient and economical pipe cutting device on the market, and is used for this purpose by all of the tube mills in Canada and most of the leading plumbing and steam-fitting houses.

Regular capacity $\frac{1}{2}$ to 2-in., with extra cage will take $\frac{1}{8}$ to $\frac{3}{8}$ -in. pipe.

Write us for catalog and prices on pipe threading lathes, any capacity from $\frac{1}{8}$ to 18-in., also single and double head rapid nipple machines. No delays, delivery from stock.

JOHN H. HALL & SONS, Limited
BRANTFORD, CANADA

The "Manny" Heater Affords Every Aggressive Steamfitter An Excellent Opportunity to Make Large Profits



The Manny Heater is connected to a hot water system as the ordinary hot water furnace, and steam is carried to it from a boiler house stationed outside the main building, at regular boiler pressure, but reduced at every heater by a steam pressure reducing valve to 20-15-10-5 lbs., or as low as one pound to the square inch, according to temperature required in the building. The steam is carried to the Manny Heater from the boiler room through underground pipes.

There isn't a better or more economical way of heating large buildings. Many furnaces can be eliminated and much space saved. Supplied with or without Thermostats. Notice how provision is made for the expansion and contraction of tubes—Threaded Joints.

Let us give you full particulars, regarding this newest and best method of heating. Write for descriptive catalog F.

The E. S. Manny Co., Montreal

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

DART Union Pipe Coupling

The kind that leaves no room for complaints and saves time

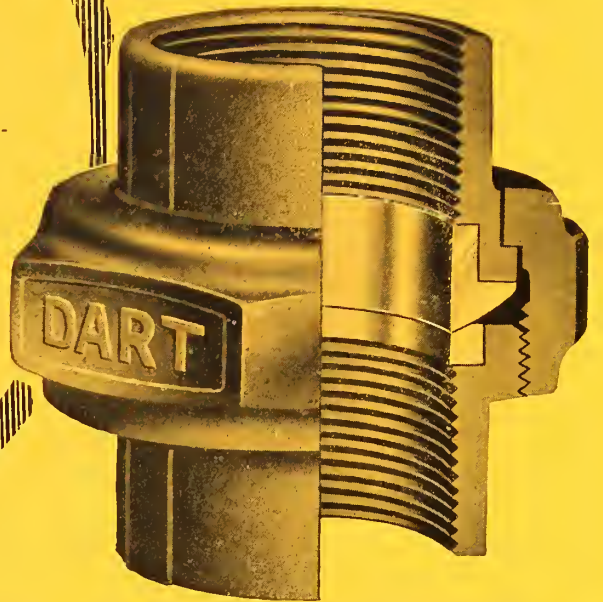
The **Two Faces of Bronze** when drawn together from a joint that **never corrodes**, nor never leaks till deliberately loosened with a wrench.

The joint being ball shaped permits the easy connecting of pipes whether the latter are in or out of line.

The trade-mark "DART" is cast on every Dart Union. It is a **guarantee** that you will immediately get 2 new unions for any defective one.

Ask your jobber for them.

Dart Union Co., Limited
Toronto, Canada

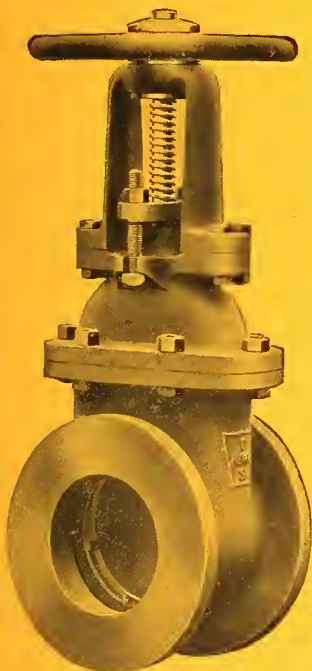


KERR GATE VALVES

OUTSIDE SCREW AND YOKE

"KEYSTONE" PATTERN

Embody all the latest features



4½-in. and larger

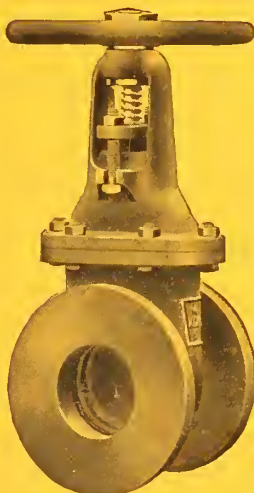
Screwed-in Seats

Deep Bronze
Bushed Gland
and Stuffing
Boxes.

Full Opening.

Large Diameter
Hand-Wheels.

Solid Wedge
Discs.



4-in. and smaller

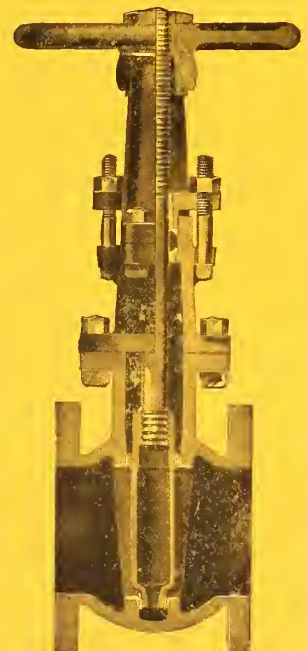
Narrow face-to-
face Dimensions

Symmetrical
Design.

Good Material.

Interchangeable
Parts.

Guaranteed
Tested.



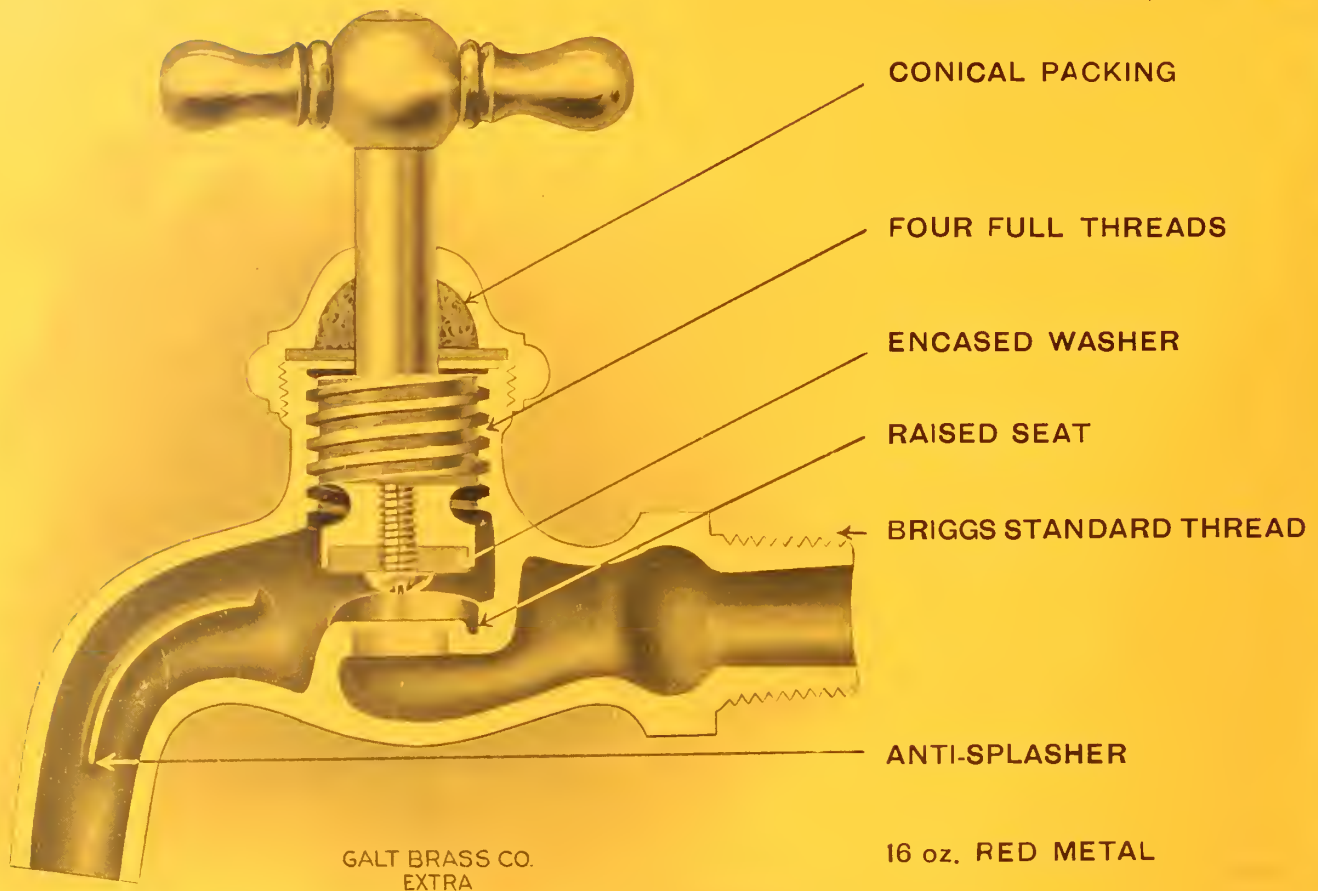
4½-in. and larger

The Kerr Engine Co., Limited, MANUFACTURERS
Walkerville, Ontario

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

"RAPIDO"

(RAPID OPENING)



The above illustration shows, in actual size, the exact construction of all our Bibbs.

The same features are also embodied in all our Bath, Basin and Sink Cocks.

TESTED AND
GUARANTEED

Any article of our make proving defective through inferior metal, or improper workmanship, on our part, will be replaced with TWO good ones, at NO CHARGE to you.

TRADE MARK
GALT BRASS

GALT BRASS CO., Limited
GALT, CANADA

THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

Publication Office : TORONTO, MAY 15, 1914

No. 10

ENAMELED
ALL-OVER

Victor BATH
ONE-PIECE

ENAMELED
INSIDE



The principle of the Victor Bath is a tub body cast integral with a Base and Wing Plates; the latter in various positions on the Tub Body to make the various Combinations, viz.:



Open Type
Corner Type
Recess Type
End to Wall Type
Back to Wall Type
Also with Extension
Rim at End or Back
for fittings—thru Rim

Catalogue and Prices on Request.

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

TORONTO
119 King St. East

MONTREAL
42-44 Beaver Hall Hill

WINNIPEG
76-82 Lombard St.

VANCOUVER
410 Carter Cotton Bldg.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

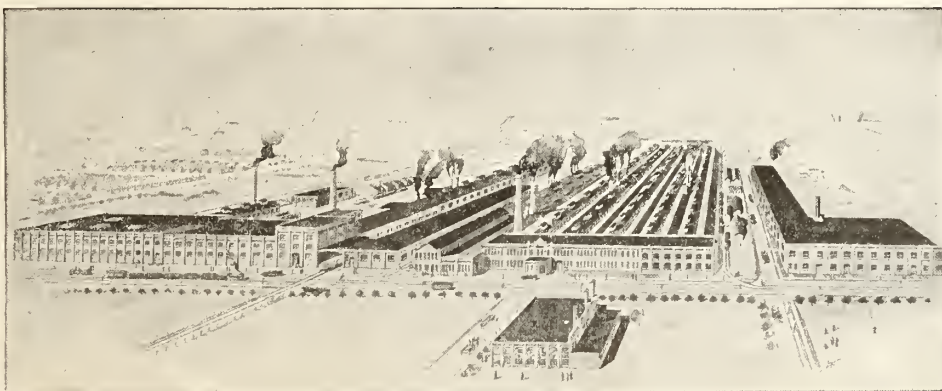
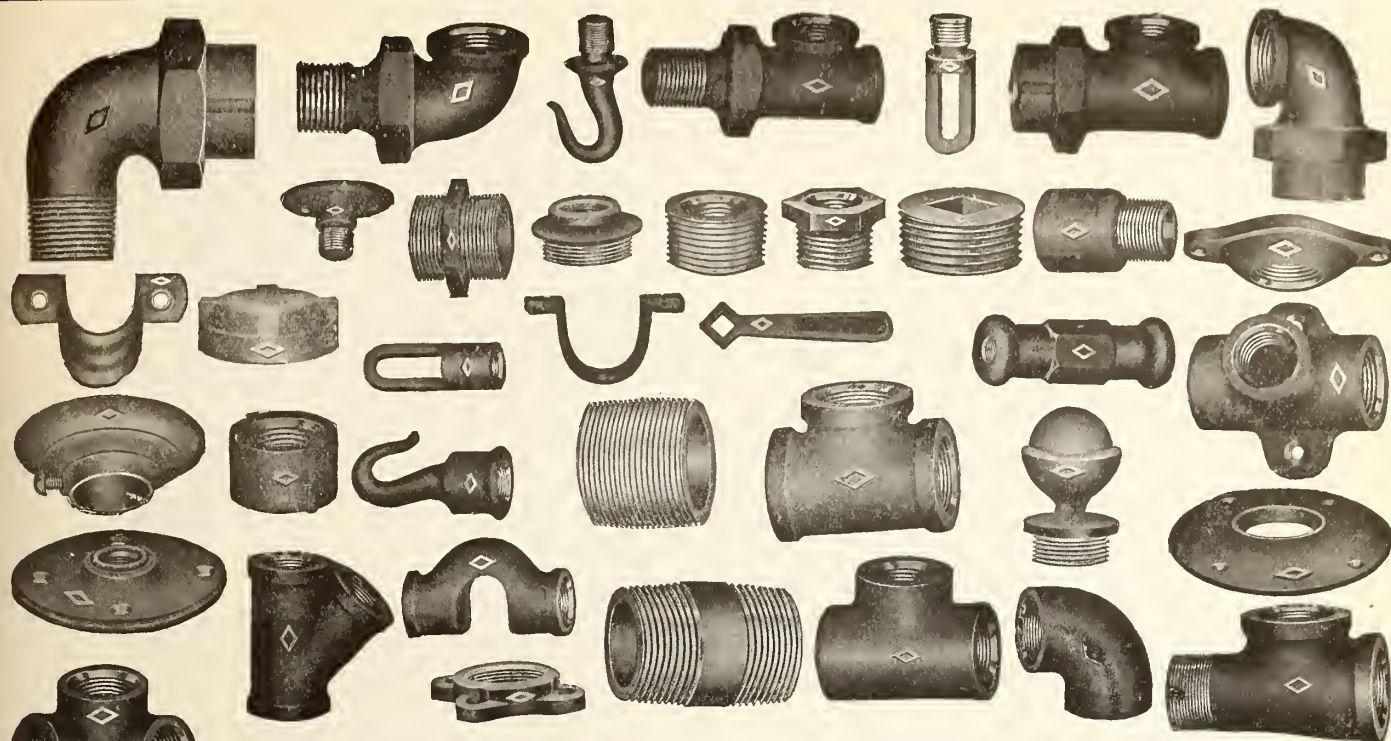
General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co.,
178 Victoria St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes,
120 Lombard St., Winnipeg

BRITISH COLUMBIA:
A. O. Campbell,
864 Cambie St., Vancouver



GENERAL OFFICES AND WORKS :

FITTINGS LIMITED, OSHAWA, CANADA

WAREROOMS :

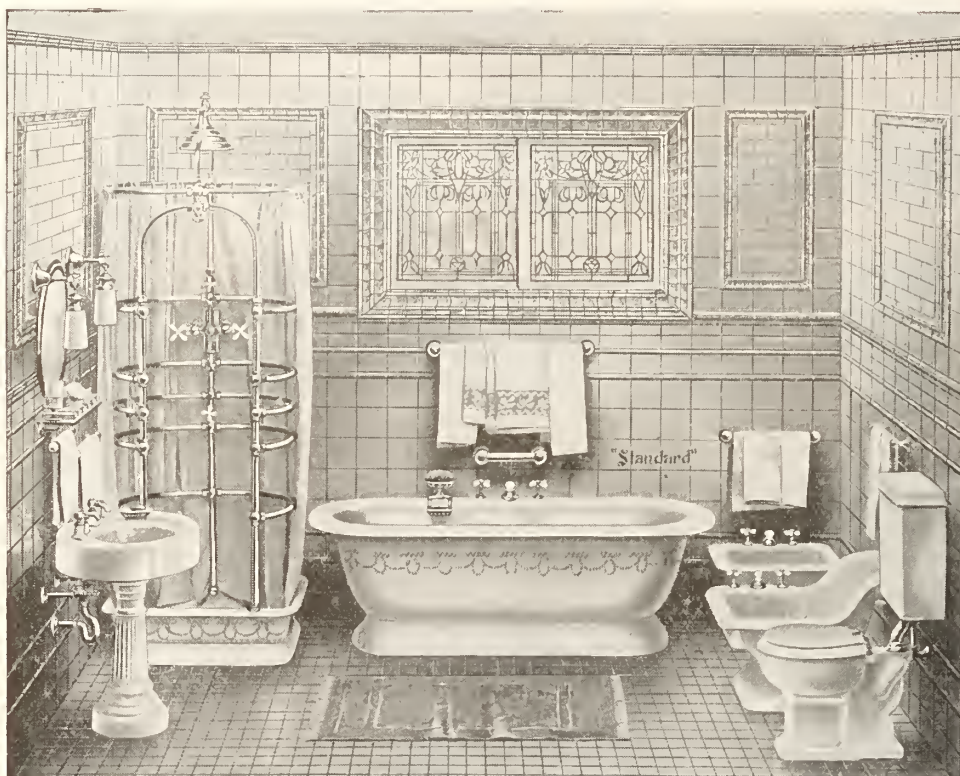
MONTREAL WINNIPEG VANCOUVER

CATALOG FURNISHED UPON REQUEST



"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

“Standard Sanitary” Plumbing Fixtures



“Standard Sanitary” Bathroom of Queen Victoria of Spain.

The above cut was made from a photograph of the fixtures actually installed in the Royal Palace of La Magdalena, Santander, Spain, the summer residence of their Majesties, the King and Queen of Spain.

A similar bathroom was also installed for the King, and eighteen other complete “Standard Sanitary” Bathrooms for the other members of the household.

This is an extremely practical and beautiful interior and combines with beauty and refinement every modern sanitary idea.

The fixtures are set into the tiling, thus offering no place for dust or moisture to collect, and reducing cleaning labor to a minimum.

The Foot, Sitz and Shower Baths make an unusually complete and artistic bathroom at a cost that is very reasonable, considering the quality of fixtures shown.

“Standard Sanitary” plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales-agents throughout the Dominion.

Standard Sanitary Mfg. Co., Limited

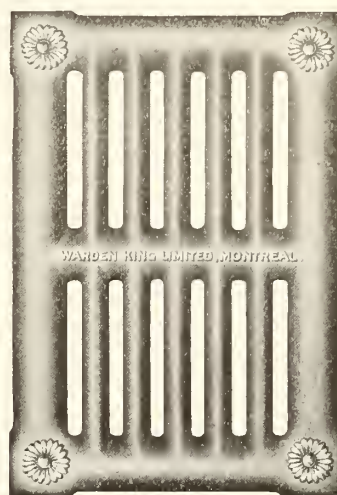
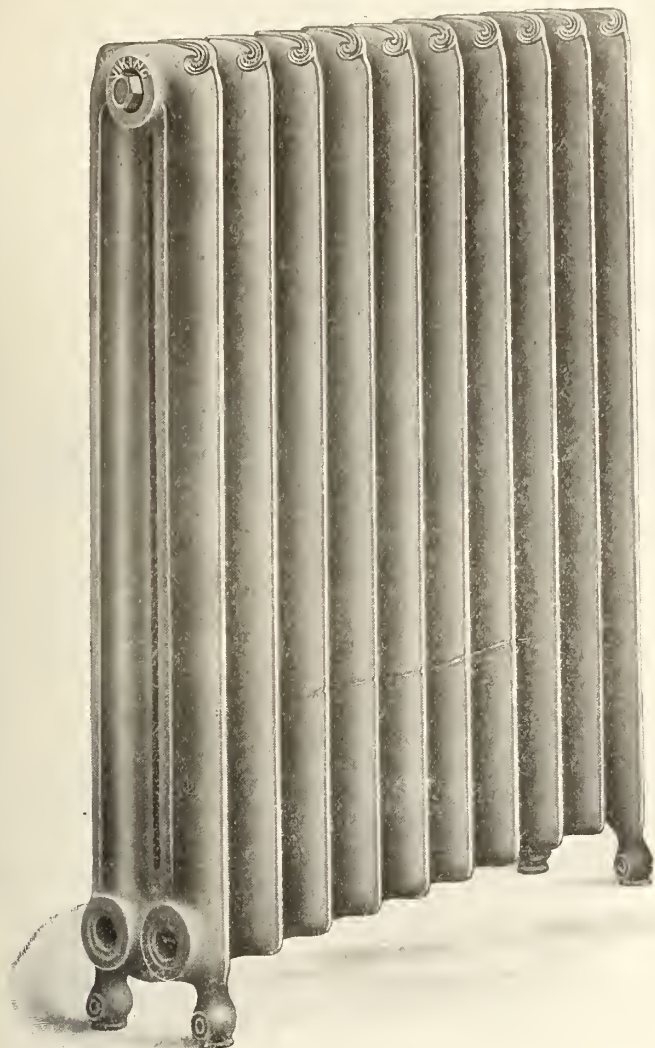
General Offices and Factory:

ROYCE AND LANSLOWNE AVES., TORONTO, ONT.

Toronto Store:
55-59 Richmond Street East.

Hamilton Store:
20-28 Jackson Street West.

Just Out!
 The New
**“VIKING”
 RADIATORS**



These are the latest additions to our products, and are the neatest Radiators on the market to-day. They are fully described in our new Catalog, which will be mailed on application.

We are the sole manufacturers of the celebrated “Daisy” Hot Water Boiler. Over 55,000 in use; this speaks for itself. Repair parts, if necessary, for any of the different styles, may be obtained without delay.

WARDEN KING LIMITED, MONTREAL
BRANCH, 200 Adelaide St. West, TORONTO

**AGENTS
 IN
 CANADA**

The CRANE & ORDWAY CO., WINNIPEG, MAN.
 The MECHANICS' SUPPLY CO., Limited, QUEBEC, QUE.
 The JAMES ROBERTSON CO., Limited, ST. JOHN, N.B.
 The WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

All's Well That Heats Well

And what is more important to the end of efficient heating than a real Radiator Steam Trap?

The DUNHAM RADIATOR TRAP:—

Will give you full value from every pound of fuel used.

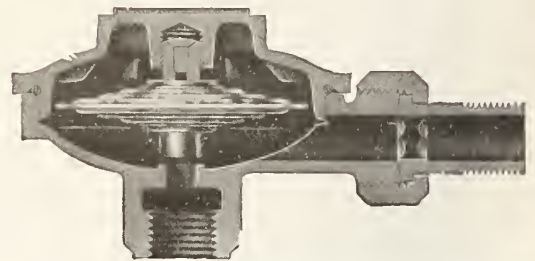
Will make circulation **positive** throughout the whole system.

Will eliminate all noise, leaky air valves and venting of foul air in the rooms.

When applied to the return end of each radiator on a Vacuum Heating System.

Are not these points of vital importance in good heating? Think it over and decide quickly to give us an opportunity of proving our claims to you.

HERE IT IS.



Performs the functions of a Radiator Steam Trap, perfectly and continuously. Eliminates water and air without loss of steam.

C. A. DUNHAM CO. Limited, TORONTO, CANADA

Vancouver—520 Duncan Bldg.

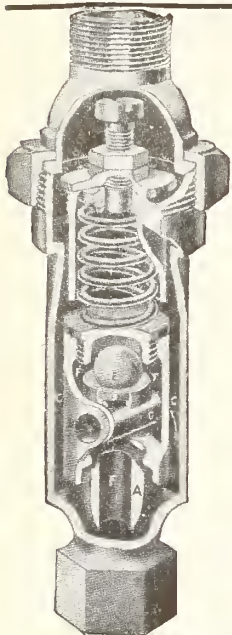
Calgary—Metals Ltd.

Winnipeg—405 Tribune Bldg.

Montreal—No. 20-11 St. Sacrament St.

Fort William—Plumbing & Engineering Supply Co.

Halifax—General Contractors Supply Co., McCurdy Bldg.



What about the
Spring in the

B

Heat Intensifier?

The maximum capacity of this valve is
3,000 Square Feet of Radiation

When the water contained in this amount of radiation is expanding to its limit—the spring compresses only

1-8 inch.

It cannot move further and this compression would not weaken it in a hundred years—who of us will be alive at the end of that time?

Use the Intensifier and also the "B" Pipe Joint Compound when installing it.

NATIONAL STEAM SPECIALTY CO.

24-26 Clinton St., Chicago

Surplus, Dunn & Co., 74 Murray St., New York

L. N. Vanstone, 8 Wellington St. East, Toronto

Moncrieff & Endress, Limited, Scott Bldg., Winnipeg

300,000 lbs.

carried in stock for immediate
shipment of

Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

Brass and Copper Rod.

Brass and Copper Sheet.

WRITE US FOR PRICES

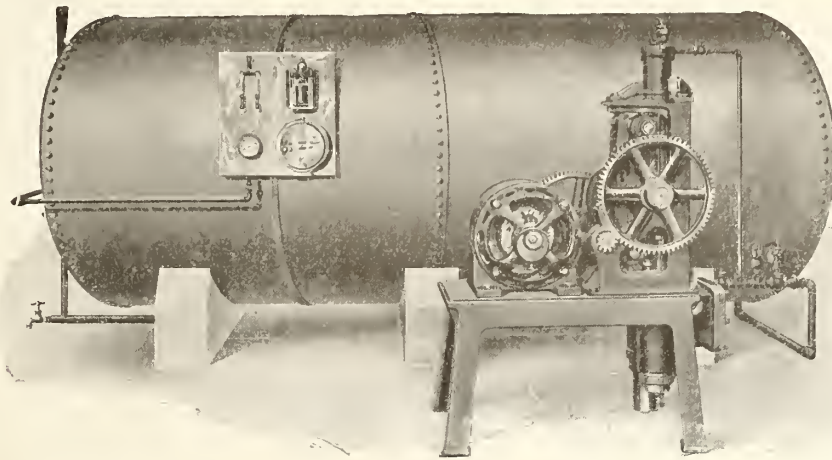
Tallman Brass & Metal Co.
HAMILTON, ONT.

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G.M.C. WATER SYSTEMS

For Strictly High-Class Pumping Equipment. Try the Luitwieler Line

300
to
1800
Gal. per
Hour
Capacity



Electric
or
Gasoline

For Suction Duty, or for Deep Wells, cased four inches or greater, there is nothing equal to these Pumps.

The General Machinery Co., Ltd.

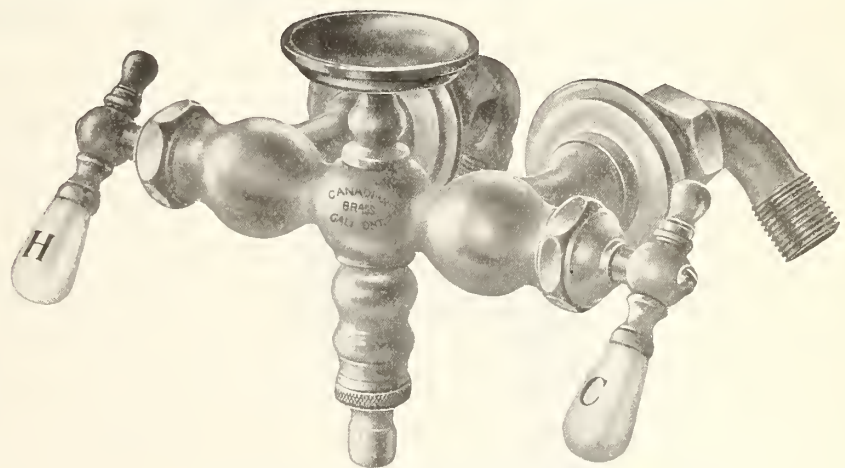
22 MULOCK AVE.

TORONTO, ONT.

PROFITS versus LEAKS

You Can't Have Both — Which Do You Choose?

Use
Cee Bee
Quality Plumbers'
Brass Goods.
They mean Profits.
They Prevent Leaks.



Cee Bee Quick Pression Bath Cock

Canadian Brass

Company, Limited
Galt, Ont.

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

THE WORLD OVER

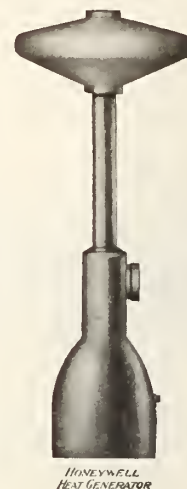
The Honeywell Heat Generator is the recognized standard seal for hot water heating systems.

MORE THAN 167,000 IN USE

The Honeywell Method of Hot Water Heating is to be found in every civilized country in the world where artificial heat is required, and when it is considered that the phenomenal growth of the Honeywell System covers a period of only eight years, the merits of the system must be recognized.

Send us your plans and let us design a system for you. It can be installed cheaper and will work much better than old style hot water.

Handled by the leading dealers in heating supplies.



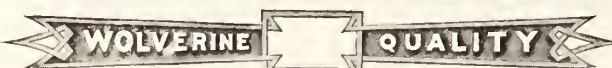
HONEYWELL
HEAT GENERATOR

HONEYWELL HEATING SPECIALTY COMPANY

NEW YORK OFFICE:
Herald Square Bldg., 141-145 W. 36th St.

WABASH, INDIANA
BIRMINGHAM, ENGLAND

MONTREAL OFFICE:
1008 Eastern Townships Bank Building

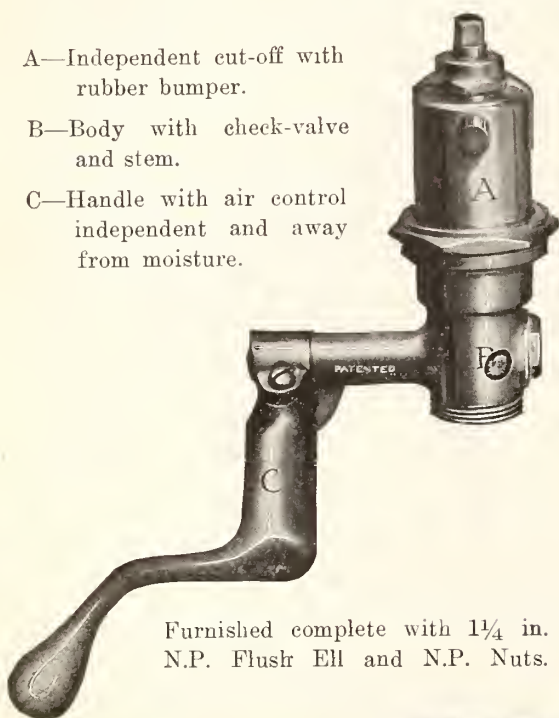


Wolverine Flushometer

PATENTED

Durable - Inexpensive - Economical - Simple

- A—Independent cut-off with rubber bumper.
- B—Body with check-valve and stem.
- C—Handle with air control independent and away from moisture.



Furnished complete with 1 1/4 in.
N.P. Flush Ell and N.P. Nuts.

The only Direct valve on the market. No small by-passes to stop up or corrode and each valve is furnished with independent cut-off with rubber seat bumper.

Flush can be adjusted without shutting off the water.

For Direct pressure or gravity systems. Write us for price and further information.

Manufactured and guaranteed by

Canadian Wolverine Co.
LIMITED

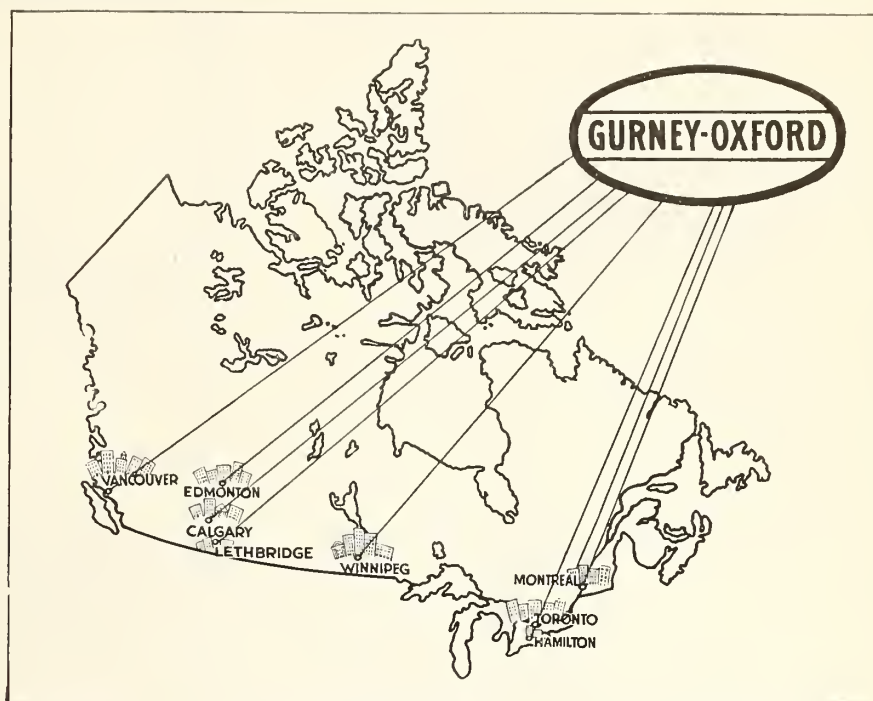
[Chatham, Ont.]



"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

A Chalk-talk on Distribution

by
Sam Oven,
who works for
Gurney's.



WITH your kind permission, we will now have a chalk-talk on distribution.

Your attention is called to the accompanying map of Canada.

You will notice that lines radiate from the Gurney-Oxford trade-mark in the upper corner to most of the big cities. These are all Gurney-Foundry Distributing Centres.

There is only one disadvantage in living in a country as large as Canada; it takes a long time to get around.

So in order to give our Plumber and Steamfitter Customers good service, **PROMPT SERVICE**, we carry stock in our own warehouses at all these places.

You will see that we are not far from anywhere.

My experience has been, at least so far as "rush" shipments are concerned, that "fast freight" is simply a phrase used by railroads for advertising purposes,

and that the time the Express People throw you down hardest is when you are in a particular hurry for the goods.

Your business is peculiar. It's not like a clothing store or a boot shop; you can't order a season ahead. You must have prompt service.

And there is, as you know, no better boost for your business than keeping a promise, or perhaps beating a date by a day and a half.

And this being so, I thought you would be interested in seeing this map of Canada with the Gurney-Foundry Distributing Points marked on it, because this is the best way I could think of to show how near we are to YOUR shop.

"Thanking you one and all," as the Professor says, "for your prompt attention," I am yours truly,

Sam Oven,

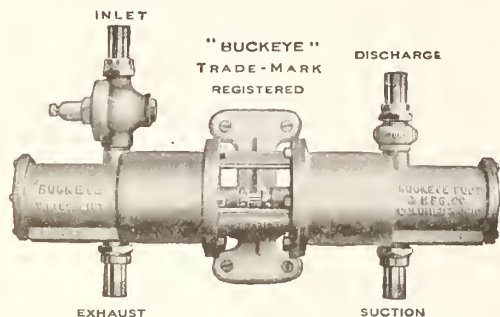
Who Works for Gurney's.

The Gurney Foundry Co., Limited

Hamilton London Montreal Winnipeg Calgary Edmonton Vancouver

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

The "BUCKEYE" Water-Lift Pump



For Automatically supplying cistern water for laundry, bath, etc.

The "Buckeye" delivers the service that builds up your profits. "Buckeye" buyers become "Buckeye" boosters, because:

The operation is positive, economical and noiseless. The construction is simple, practical and durable. The connections are easily got-at-ible—see cut. The installation may be either right or left-hand. The pump cannot stop or stick on centre.

The pump runs only when cistern water is used. Check valve on pump prevents back pressure on motor.

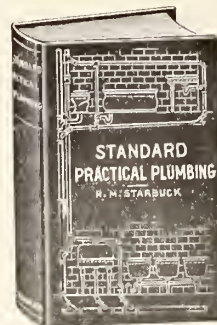
Only seven cup leathers and two stuffing boxes.

The pipe connections are of uniform size.

"Buckeye" means greater water-lift profits.

May we send you catalog and prices?

The Buckeye Pump & Manufacturing Co.
COLUMBUS, OHIO, U.S.A.



A WANTABLE BOOK

Standard Practical Plumbing

By R. M. Starbuck

347 SPECIALLY MADE ILLUSTRATIONS

PRICE \$3.00

"Standard Practical Plumbing" is indispensable to the Master Plumber, the Journeyman Plumber, and the Apprentice Plumber. As the book is specially strong in the exhaustive treatment of the skilled work of the plumber, it commends itself at once to every one working in any branch of the plumbing trade. Send for it to-day.

TECHNICAL BOOK DEPARTMENT

MACLEAN PUBLISHING COMPANY
143-149 UNIVERSITY AVENUE - TORONTO

PEASE IDEAL STEAM BOILERS

Write to-day for
Catalogue and Prices.

PEASE FOUNDRY CO.
Limited

Works: Brampton. Head Office: Toronto.
Branches: Vancouver, Winnipeg, Hamilton, Montreal

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal

Works: Lachine Canal

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

The fact that 95 per cent. of Private Water Systems—both Hand and Power—installed in Canada are Peerless, is a convincing argument in their favor.

When a Canadian Plumber thinks of a Domestic Water Supply he thinks of "Peerless"—he can't afford to install anything else. Quality, Variety, Engineering Experience, Reputation and Price are the points that count when he buys a plant.

SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, MAY 15, 1914

No. 10

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The MacLean Publishing Co., Limited

JOHN BAYNE MACLEAN, *President*
T. B. Costain, *Managing Editor*

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From 1 to 250 lbs.

This rigid test is applied to every **Vitro** Tank before it leaves our works

**Over
160,000**

**now on the
market**

Watch These Figures Grow

This will give you a comprehensive idea of the strength of the **VITRO** and why 8-year-old Vitros are as good to-day as the first day they were installed.

Vitro tanks are composed of a material that holds water without a lining, and never rusts, decays or soaks up.

The Ball Cock, Flush Valve and Lever are all made from the best quality ingot metal. These parts work smoothly and noiselessly, and will give hard service for years without repair.

Ask for catalog.

Cluff Manufacturing Co., Limited

Office and Factory: 65-75 Sterling Road, Toronto, Ontario

SOLD BY ALL JOBBERS

STEEL AND RADIATION, LIMITED

"KING" BOILERS



No. 6. High Base "KING" Boiler, Showing Double Shaker.

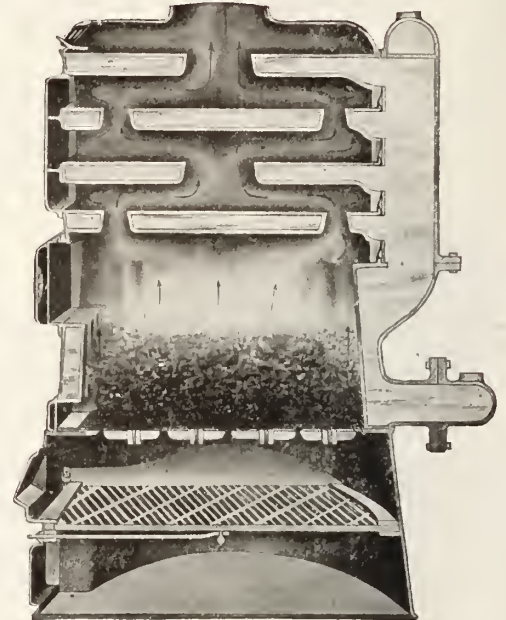
A Hot Water Boiler That Is Standing The Test.

"KING" Boilers carry our unqualified guarantee.

Mr. Heating Engineer,—

Isn't it worth something to deal with a house that has faith in its product and will stand behind the goods they manufacture?

The talking points on a "KING" Boiler are numerous, in fact too numerous for us to attempt to explain them in this limited space. A few of them need no explanation and are shown in the accompanying cuts.



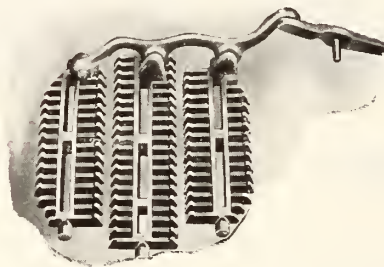
Sectional View of "KING" Boiler. Showing Improved Design of Waterways, Combustion Chamber and Fire Travel.

"SPECIAL FEATURES"

The large one-piece ashpit.
The special shaking grates and convenient shaking arrangement.
The fire-pot with a real corrugation.
The well-arranged and properly proportioned combustion spaces.
The easily-cleaned flues.
The double shaker.



"KING" Fire-Pot. Showing Wide Corrugation, Adding One-third to Heating Capacity.



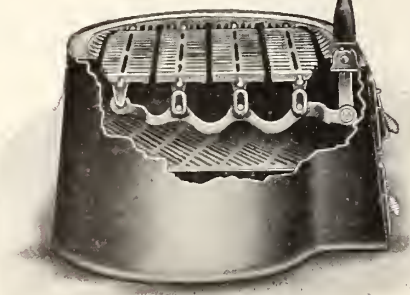
Grate Bars and Connecting Bar, Showing Method of Connection Without Bolts or Pins.

Investigate for Yourself.

Did you get one of our new catalogues or hand books? They are complete and contain valuable information. Drop us a card and we will mail it.

Try us for your Valves, Pipe and Fittings, as well as Boilers and Radiators. Right prices and prompt delivery.

The perfect fit doors.
The thin and rapid circulating waterways.
The extended and scientifically arranged heating surfaces.
The absence of defective sections on account of the use of iron patterns.
The ease of erection.



"KING" One-piece Ashpit, Showing Patented Improved Trouble-proof Grates and Shaking Mechanism, Free from Bolts or Pins.

STEEL AND RADIATION, LIMITED

HEAD OFFICE: FRASER AVE., TORONTO

Showrooms: 80 Adelaide St. E., Toronto

304 UNIVERSITY ST., MONTREAL

101 ST. JOHN ST., QUEBEC

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

THE SANITARY ENGINEER

VOL. VIII.

MAY 15, 1914.

No. 10

Canadian Institute of Sanitary Engineers Hold Their Annual Convention

This Convention Took Place in Edmonton, Alta., and Proved to be the Best Ever Held by This Society — Splendid Reports and Recommendations Read Which Are of Vital Importance to Each and Every One in the Trade.

THE convention opened on Monday morning, at ten o'clock, by the secretary-treasurer, William McFarlane, reading the minutes of the last meeting. Auditors were appointed to examine the financial statement. The president, James Smith, chief plumbing inspector of Winnipeg, took the chair.

Following up his set speech, the president went on to speak of the aims of the Institute, and the difficulties they would meet. They had invited master and journeymen plumbers to join with the inspectors, believing they could work better together than individually. He suggested that the meeting be open to all, but that when voting on legislative matters and by-laws there should be one vote for inspectors, one for journeymen, and one for the masters, so that one class would not influence the voting unduly. There should be one vote from each city, representing each class, and no voting by proxy.

G. Edgar Knechtel, Saskatoon, followed. It would take a number of conventions, he said, to make a uniform by-law, and a good deal of work would have to be done outside of convention. They were not there talking dollars and cents, but on plumbing as a business, standardization of fittings, etc.

Harry Nash, Edmonton, thought the president's suggestion of one vote for each class was the best, that the Institute be composed of all branches, so that they could all work together, otherwise they would not be able to frame a good by-law.

George Wharton, Winnipeg, suggested that the more votes the better.

Replying, the president said that if they admitted everybody indiscriminately it would be a race between the three organizations to see which could get most active members at the convention to swing the voting their way. It was the intention to form chapters of

the Institute in each city, which could meet during the winter and discuss these matters, and bring their recommendations to the convention every year. They could not in fairness to the small cities, however, give every member a vote.

G. T. Taylor remarked that the constitution of the American Institute had

avored a system by which each province could send a delegate; or he would suggest that each incorporated city have a vote instead of the province.

Mr. Fletcher, Calgary, suggested that the provincial health officer act for his province, and have an active part in the discussions.

Mr. Smith: Do you mean to ask them to become active members, with voting power?

Mr. Fletcher: Yes; you can't expect a man to be interested unless he has voting power, excepting, of course (pointing to Mr. L. L. Anthes, who was seated at his side), these manufacturers, who are interested financially.

Neil Beaton, Saskatoon, thought the cities might not be in accord with the provincial health officers. Why not have a provincial association affiliated with this association, and invest them with the power to vote? Then they would be nearer a solution.

Horace C. Nixon, Saskatoon: Mr. Fletcher's suggestion is a good one. Get the provincial health officer here and educate him if he is wrong. If we are wrong, let him educate us.

Mr. Knechtel observed that the only objection to the provincial officers was that their work was broad. Sanitary engineers were specialists—some thought they were too much specialists. It was all right to educate them, but why not spend the time educating themselves?

Harry Nash: I'd like to see them here, so that our laws would comply with the provincial by-laws, and they could assist us in that.

Duncan Campbell, Medicine Hat, told of the power invested in medical officers of health, and suggested that they be invited to help in getting the present laws repealed, and new ones made for the whole province. J. T. J. Vallance, Lethbridge, also favored the suggestion, whereupon a committee, composed of



JAMES SMITH,
Re-elected president.

been adopted, and asked was there any mention in that of voting powers.

On investigation, it was found that there was no mention, whereupon Mr. Taylor moved that this clause be adopted. Mr. Smith said this would be left to a resolution committee to be appointed shortly.

At this point E. P. Fletcher, chief plumbing inspector of Calgary, made an important suggestion, to wit, that it would be advisable to have a provincial vote. The prairie provinces were fully represented there, whereas British Columbia was represented by only one city, giving an overwhelming vote against the latter province. Having a provincial vote would equalize matters. Western Ontario might want certain legislation, which would be over-ridden by representatives of other provinces.

Mr. Knechtel, Saskatoon, said he

Messrs. Fletcher, Nixon and Nash, were appointed to discuss changes in the by-laws.

The auditors reported the statement of the treasurer satisfactory, and suggested that Mr. McFarlane's expenses be paid. Mr. Smith agreed with them in this, and took the opportunity to tell of the hard work performed by Mr. McFarlane in arranging convention details, adding that it was due to his splendid work that such a convention was possible. It was for them to say what the secretary should be paid.

H. A. Mathias, Regina, joined in the opinion that Mr. McFarlane's services should be acknowledged, and suggested that he be given the \$50 balance in the bank. The matter was eventually left

who were unable to be present. One was from the manager of Metals, Ltd., Lethbridge, expressing a hope that members would arrange for a uniform by-law to be adopted by the provinces. Greetings were received from the Winnipeg branch of the Sanitary Inspectors' Association of Western Canada, and from J. G. Morgan, health department, Vancouver, who hoped that the members "would have as good a time as was compatible with the performance of their duty, always remembering that the 'extraordinary' expenses had a tendency to outrun the legitimate."

An invitation was received from the secretary of the Retail Merchants' Association, Alberta branch, to attend the convention of the above at Calgary, on

Mayor McNamara was unable to be present, his place being taken by Ald. Joe Clark. In the chair was G. R. Huntbach, Edmonton. After the delegates had eaten all they could, Mr. Huntbach called on Ald. Clark to address the gathering.

The latter delivered a rousing speech, in which he showed a thorough grasp of the subjects being discussed by the Institute. After delivering the stereotyped civic welcome, he drew attention to the fact that a ball game would take place in the afternoon between Edmonton and Saskatoon, and it was his duty as chairman of the ball committee to see that no Saskatoon member attending the convention got in and spiked the Edmonton players. He advised them to get through



Visitors to the Canadian Institute of Sanitary Engineers' Convention recently held in Edmonton.

1.—A mixed group of delegates; 2.—Resolution committee making a change in the Constitution of the Canadian Institute of Sanitary Engineers, left to right: Fletcher, Calgary; Nash, Edmonton; Nixon, Saskatoon; 3.—Representing manufacturers, left to right: L. L. Anthes, E. B. Plewes, F. S. Lamson.

over on the suggestion of Mr. Nash, who thought the amount could be increased.

Soak the Manufacturers.

Mr. Fletcher, always ready for a jibe at the expense of the manufacturers who were sitting near him, thought that the above gentlemen should be "soaked good and heavy for membership fee." That would make the salary worth while. At present the manufacturers did not know where they got off at. His friend Needham recently had his trunks all smashed up, and the new by-law would save them all kinds of trouble.

At this point it was announced that theatre tickets would be distributed in the evening, all ladies being invited. Some one asked where the ladies were. The reply was to the effect that they would be supplied.

Greetings.

The secretary then read greetings from other associations and members

May 7, to meet the sanitary and heating engineers' section of the association. An invitation to a banquet was included.

George Wharton, Winnipeg: Will it be possible to take in the banquet here on Wednesday night and that in Calgary on Thursday? The question was not answered.

Mr. Fletcher hoped that members would conduct themselves in such a manner at the Edmonton banquet that they would be a credit to the Institute when they reached Calgary.

Before adjourning, Mr. McFarlane reminded members that their fees were due in January, but he did not press for payment then. However, they were due from now on. The convention then adjourned for luncheon.

Edmonton's Reception.

Luncheon had been prepared in the convention hall at the city's expense.

their business as quickly as they could, or they would have difficulty in seeing the game.

Plumbers and Lawyers.

Proceeding, he stated that he was a lawyer, and they resembled one another in their reputation for making large bills that would make a Rockefeller quake in his shoes. He hoped they would make their accounts large enough to keep the wolf away from the door, but not too large, or they would not get them paid, when they would go to the lawyers. Then they would wish they hadn't.

He referred to the important work required from sanitary engineers in the West—more important than that in the settled districts of the East. The only way to grapple with the difficulties that presented themselves was with conventions like this. It would be much better if they had uniform laws governing plumbing in western cities. Different

laws worked to the disadvantage of all concerned.

They were there making history, and people in future years would marvel and wonder how they accomplished it. They would find the city council of Edmonton the most willing of any in the West in making the new by-law effective. (Cheers.)

He was followed by the president, who informed them that he did not intend to say much, as Mr. Anthes had asked him to be brief, so that he could get a word in.

Mr. Anthes, on rising, refuted this, and hoped he could not judge western veracity by Mr. Smith. Mentioning the subjects being discussed by the convention, he said the standardization of fittings would mean a big difference in the number of sizes they would be required to manufacture.

This ended the speeches. Mr. Smith asked members to get to work quickly so that they would be in a position to see the ball game. However, it was a long time before they were got together for the afternoon session.

Monday Afternoon Session.

When the delegates met again on Monday afternoon, the resolution committee appointed in the morning were asked to report. H. C. Nixon, speaking for the committee, asked all members to have a copy of the constitution handy. On page 5, article 2, they recommended that a new section be added, with the heading: Voting power on legislation, the section reading: "Votes on legislation will be vested in delegates from each city, consisting of one journeyman, one master plumber, and one inspector."

They also recommended for page 6, section 3, in article 3, that the word "shall" be changed to "may," and that the words "and are so passed by the directors" be added to the section.

Mr. Swain, St. Boniface, moved, and Ald. Gothard, Wetaskiwin, seconded,

that the report of the committee be adopted. Carried.

It was decided to discuss sizes of soil pipe, etc., which was down for the afternoon session, and the secretary commenced to read the recommendations from three cities. These proved long and statistical, and Mr. Fletcher suggested that the stenographer make copies of the reports for all the members. As this would take half a day, it was decided to take up the matter of "Pipe terminals." The secretary read the recommendations along these lines, which were not so long, and the discussion commenced.

The recommendations were as follows:

RECOMMENDATIONS OF WINNIPEG COMMITTEE.

Re Pipe Terminals.

All terminals of soil, waste or ventilating pipes of 4 inches in diameter or less shall be increased 2 inches in diameter before passing through the roof of the premises, and all terminals of such pipes shall project to the outer air not less than 1 inch and not more than 2 inches above on the high side where passing through a pitched roof, and not less than 3 inches or more than 5 inches above where passing through a flat roof, provided that the portion of all such pipe terminals above roof shall have a hub of a size in proportion to which the pipe is increased, and the same shall be made weather-proof by means of a lead flashing. All such lead used for this purpose shall be in weight at least six pounds per square foot, and shall be worked over and into the hub with not less than 5 inches of cover on the roof on either side of the pipe terminal, and it shall be finished with a cast or wrought iron ring properly caulked into the hub, which shall in no case project above such terminal. All terminals of soil, waste or ventilating pipes shall where passing through a pitched roof be

carried to a point within 2 feet of the ridge or peak of the roof, and shall be located not less than 10 feet from or 2 feet above any window, door, or other opening in the same or adjoining premises, provided that in all cases a roof with a pitch of 6 inches or more in 12 inches shall be considered as a pitched roof.

Sizes of Soil, Waste and Ventilating Pipes.

Section 34.—Main Soil Pipes.

1 to 6 Floors.—For not more than 25 water closets and not exceeding 15 water closets above fourth floor, 4 inches. If more than 15 water closets to be installed above fourth floor, soil pipe to be 5 inches.

7 to 10 Floors.—For not more than 60 water closets and not exceeding 30 water closets above eighth floor, 5 inches. If more than 30 water closets to be installed above eighth floor, soil pipe to be 6 inches.

10 or more Floors.—Six inches.

In any case where it is found necessary to erect a main soil pipe for not more than 6 water closets located above sixth floor said main soil stack may be 4 inches in diameter, provided that this will apply only where no other fixtures connect therewith below sixth floor.

Main waste pipes for kitchen sinks, 1 to 4 floors and for 2 to 8 sinks, 2 inches.

Main waste pipes for kitchen sinks, 5 or 6 floors, and for 10 to 12 sinks, 2½ inches.

Main waste pipes for kitchen sinks, 7 or more floors and for 14 or more sinks, 3 inches.

Branch waste pipes for kitchen sinks, 1½ inches.

Main waste pipes for baths, wash basins and laundry tubs, for three or more fixtures, 2 inches.

Branch waste pipes for baths and laundry tubs, 1½ inches.

Branch waste pipes for wash basins



No. 1—J. T. J. Vallance, Lethbridge; No. 2—Saskatoon delegation, left to right: N. Beaton, G. E. Knechtel, J. J. McGrath, H. C. Nixon, G. T. Taylor, M. J. McGrath, J. Stevenson; No. 3—R. J. Swain, St. Boniface, Man.

where not more than one installed, 1¼ inches.

Main waste pipes for ordinary slop sinks, with 2-in. outlets, 1 to 3 fixtures, 2 inches.

Main waste pipes for ordinary slop sinks, with 2-in. outlets, 4 to 6 fixtures, 2½ inches.

Main waste pipes for ordinary slop sinks, with 2-in. outlets, for more than 6 fixtures, 3 inches.

Main waste pipes for pedestal slop sinks, 3 inches.

Branch waste pipes for pedestal slop sinks, 3 inches.

Main waste pipes for stall urinals, 3 inches.

Main waste pipes for stall urinals, not more than 6 fixtures, 2½ inches.

Branch waste pipes for stall urinals, 1 to 3 stalls, 2 inches.

All branch waste pipes for kitchen sinks over 10 feet in length shall be 2 inches in diameter throughout their entire length and all horizontal waste pipes shall have a fall of at least a quarter of an inch to the foot.

Four traps of 1¼-in. or 1½-in. diameter and three traps of 2-in. diameter shall be considered equal to one trap of 4-in. diameter.

Section 48.

All traps shall be protected from syphonage and back pressure by anti-syphon or vent pipes, except where otherwise specifically provided by this by-law. Such pipes shall be constructed according to the following table:—

Diameter of pipe.	Maximum length of pipe which may be installed.	Number and sizes of traps that may be vented thereby.
1¼ inches.	30 feet.	1 trap 1¼ in. in diameter.
1½ "	30 "	1 to 3 traps of 1¼ in. to 2 in. diameter.
2 "	50 "	1 to 3 traps of 3 in. to 4 in. diameter.
2½ "	75 "	4 to 7 traps of 3 in. to 4 in. diameter.
3 "	100 "	8 to 15 traps of 3 in. to 4 in. diameter.
4 "	200 "	16 or more traps of 3 to 4 in. diameter

Four traps of 1¼ in. or 1½ in. in diameter and 3 traps of 2 in. in diameter shall be considered equal to 1 trap of 4 in. in diameter.

Where loop or circuit vents are used not more than 3 traps shall be inserted on the loop or circuit without an intercepting vent pipe, and the vent pipe at the end of the line shall be taken off between the last two fixtures fittings.

Section 49.

All offsets on ventilating pipes shall where practicable be made at an angle of not less than 45 degrees to the horizontal, and in no case shall 90-degree elbows be used, provided that all main ventilating pipes shall be full diameter throughout their entire length, and shall connect at the bottom with soil or waste pipe or the house drain in such a manner as to prevent the accumulation of rust scale. In no case shall a main vent pipe be greater in diameter than the main waste pipe with which it connects. Branch ventilating pipes shall be carried at least 6 inches above the top of all fixtures connecting therewith, and shall in all cases be kept not less than 4 inches and not more than 18 inches from the crown of connecting traps and not more than 3 inches below the waste level of any trap, except water closets, in which case no such vent pipe shall connect to the heel of a water closet bend, but shall connect above the centre line of horizontal part of bend. Where fixtures are installed above each other, and where the discharge of the fixtures above exceeds twice the area of the main soil or waste pipe, the nearest vent must rise at an angle of 45 degrees to the vertical.

fixture to the stack on the lower floors shall have a continuous waste and vent pipe of not less than one-half the diameter of the main soil or waste pipe, and

Section 50.

Vent Pipes Shall Not Be Necessary.

(A) Where the trap for the upper fixture on a stack is not more than 3 feet from such stack and the connection of the waste pipe to such stack is not more than 3 inches below the water level of the trap.

(B) Where only one water closet is connected with a stack and is located not more than 3 feet from such stack.

(C) Where two water closets are located not more than 3 feet distant from the stack on the same floor and discharge into a double Y branch, and no other water closet discharges into the stack above such double Y branch.

(D) Where not more than one water closet and one to three smaller fixtures are installed on only one floor, provided that this will apply only in cases where the waste pipes from the smaller fixtures do not exceed 1½ in. in diameter, and are connected directly and separately to the main soil pipe at a point above the water closet connection in a manner as set forth in the foregoing sub-section A of this section.

Sections 51 and 52.

Vent or anti-siphon pipes shall where possible be run on the continuous waste and vent principle, and shall be extended through the roof, or may reconnect to a main soil or vent pipe at a point at least 6 inches above the highest fixture connected therewith.

Standardization of Pipe and Fittings. Section 55.

All cast iron pipes and fittings must be true to drawings shown in schedule F, sound, free from cracks, sandholes, blowholes and cold shuts. No filling with metal, cement or other material, or burning on of iron to be permitted.

The inside diameter of the barrel shall not be less than ⅓ in. less than the nominal size of same. The wall thick-



No. 4—Delegates who have not met for 12 years, left to right: J. M. Highett, Duncan Campbell, Medicine Hat; A. L. Milligan, Calgary; Alderman Gothard, Wetaskiwin; No. 5—E. P. Fletcher, chief plumbing inspector, Calgary, whose head is being shielded by the hat in the hands of E. T. Needham, British Columbia Representative of the Canadian Wolverine Co., Chatham, Ontario; No. 6—Edmonton delegates, left to right; H. Dean, W. C. Ocham-paugh, S. Bowcott, G. Brown, J. Maxwell.

ness shall be uniform, showing no greater variation than 1/32 in. in "X H" pipe and 1/64 in. in "Med" pipe and hub and spigot ends to present a true circle.

The bore shall be smooth and free from fins, ridges and adhering sand, and, except for unavoidable irregularities, the full nominal bore must be maintained.

The iron used in their construction to be of such a quality as will admit of easy cutting with file or chisel. All pipes and fittings shall be thoroughly coated inside and outside with coal tar, pitch, or oil and shall have the manufacturer's name or trade mark and whether "Med" or "X H" clearly stamped on hub thereof.

Section 57.—3rd sentence to read:

All fittings for waste soil pipes and rain water leaders shall be of heavy cast iron, recessed and drainage fittings with threads tapped to give a uniform grade to branch pipes of at least 1/4 inch per foot and shall be true to drawings shown in schedule F.

Review of By-law.

Recommendation for Amendments and Additions to Sections.

Addition to Amended Section 21.

"Provided that the floor drain outlet of any garage shall be made in a manner approved by the plumbing inspector."

Section 25.

Add to end after "Accessible":

"Such cleanouts in all cases shall be formed by Y fittings and one-eighth bends or by special base fittings."

Section 41.

Add after word "fixture" on first line "or drain inlet" and add to end of section: "And all floor drains from lavatories or kitchens shall discharge over a catch basin trap or water supplied fixture."

Sub-section A.

Add after word "All" on first line "fixture and floor drain."

Section 46.

Add after word "soda water fountain" "bar waste soft water lifts."

Section 28—(6949).

To delete the words "fitted on cast iron pipe" and "screwed" and add to after the word "airtight" "by the use of graphite or graphite gasket."

Section 15.—Add to last line.

"The water test shall not be applied in extremely cold weather unless the premises are heated."

Recommendation

For Standardization of Brass Pipe and Fittings.

All brass pipe used for soil, waste and vent pipes shall be thoroughly annealed

seamless drawn tubing having not less than the outside diameter, weight and thickness and gauge set forth in the following table:

Outside diameter of pipe.	Weight per lineal foot.	Thickness in inches.	British Imp. Wire Gauge.	Brown & Sharp Gauge.
1 1/4 inches	0.88 pounds.	1-16 inch.	16.	14.
1 1/2 "	1.06 "	1-16 "	16.	14.
2 "	1.54 "	1-16 "	16.	14.
2 1/2 "	2.82 "	7-64 "	12.	10.
3 "	3.41 "	7-64 "	12.	10.
4 "	5.74 "	3/8 "	10.	8.
5 "	7.22 "	3/8 "	10.	8.
6 "	8.71 "	3/8 "	10.	8.

All brass pipe used for outlets from fixtures, overflow pipes or flush pipes or any part of a waste pipe on the local side of any trap shall be not less than 16 British Imperial wire gauge or 14 Brown and Sharp gauge, and all tees, couplings and fittings on such pipes and traps shall be of heavy cast brass, with iron pipe or standard brass threads.

Brass pipe fittings with screw joint connections shall have not less than the following number of threads per inch and depth of bite.

Size of pipe.	Number of threads per inch.	Depth of bite.
1 1/4 inch to 2 inch.	20	1/2 inch.
2 1/2 inch to 3 inch.	12	3/4 "
4 inch to 6 inch.	12	1 "

Brass drainage fittings and traps shall be recessed, and of first quality cast brass, having a smooth interior and thickness in their walls, of not less than twice the tabular thickness given in the table of brass pipe sizes. The recessed parts or sockets shall be at least one and a half times the thickness of the wall of fittings.

All connections between brass pipes and iron pipes shall be made by a brass threaded bushing with a standard iron pipe thread outside and a standard brass thread inside, and all brass fittings and traps shall have legibly stamped on a conspicuous place the name or trade mark of the maker thereof.

All brass water supply pipes shall be of iron pipe gauge and all threaded connections on such pipes shall be equal to iron pipe threads for same size of pipes and shall be tapered. In no case shall slip joints be made on water supply pipes. The diameters and weights per lineal foot of all brass tubing used for this purpose shall be not less than is set forth in the following table:

Diameter.	Pounds per lineal foot.
3/8 inch .. .. .	.62 pounds
1/2 " .. .. .	.90 "
3/4 "	1.25 "
1 "	1.70 "
1 1/4 "	2.5 "
1 1/2 "	3. "
2 "	4. "
2 1/2 "	5.75 "

All fuller bibbs or traps are prohibited and the mechanical parts of all ball cocks must be above the water level. All water supply pipes to flush tanks shall

be provided with compression stop cocks and all compression stock cocks shall have a packing box.

All brass goods must be approved by the plumbing inspector.

Resolution

Re Examination of Plumbers.

WHEREAS examination of plumbers is considered necessary for the proper protection of public health.

WHEREAS such examination should be of great benefit to public health and raise the status of the plumbing trade.

BE IT RESOLVED that this meeting of the Winnipeg branch of the Canadian Institute of Sanitary Engineers go on record as favorable to such examination provided that said examinations are conducted by local examining boards under the authority of a provincial plumbing inspector appointed by the provincial health board, who will either by himself or by an assistant, be represented at all examinations held in the province over which his authority extends. Said provincial plumbing inspector shall also be empowered to see that proper inspection of plumbing is maintained in all rural and urban districts and have power to appoint a sufficient number of inspectors to carry on this work where such is not done by the several municipalities.

BE IT RESOLVED also that each examination shall consist of—for master plumbers not desiring to have a license to work with the tools, a theoretical examination—for master plumbers desiring to have a license to work with the tools or for journeymen plumbers; a theoretical and practical examination.

Resolution

On the Encouragement of Technical Education.

WHEREAS this meeting has gone on record as favorable to examination of plumbers.

WHEREAS such examination of plumbers is unreasonable without education both practical and theoretical.

BE IT RESOLVED that it is the sense of this meeting that we should as far as possible encourage technical education particularly in the larger cities of Western Canada, and

BE IT FURTHER RESOLVED that all members of this institute urge on the school boards in their cities the necessity for technical education in plumbing, and

BE IT FURTHER RESOLVED that a copy of this resolution be sent to all the school boards in cities represented by membership in this institute.

Mr. Nixon, Saskatoon, thought this was a subject on which the various cities had got into line on, and there was little difficulty. Discussing the system used in Saskatoon, he said that where they had a pipe close to the roof it retarded the velocity of the outgoing air, which then deposited its moisture. Keeping the pipe the same diameter, the air got

said he was going to use his discretion in the matter of members speaking twice. Continuing, Mr. Fletcher said it was the warm air rising in the stack which came in contact with the cold metal that caused the trouble.

Mr. Wharton: If you have a smaller pipe than 4 in. in the roof, is it not necessary to increase it to prevent freezing?

Winnipeg Experiments.

At this point Mr. Smith left the chair, and his place was taken by Mr. Fletcher, vice-president. The president then proceeded to tell of the experiments made in Winnipeg, with various sizes of pipe, under varying weather conditions. He illustrated this with photographs of the pipe at various periods, showing frost formation, and with charts showing graphically the size of opening secured with different pipes.

One photograph showed an unprotected pipe, which was closed as long as the temperature remained below minus 30 degrees, but commenced to open above that temperature. Another chart showed a 6-in. pipe on the same building which only took three or four days to close up entirely, and remained closed when the

conditions were the same as with the 8-in. pipe.

He next showed a 6-in. increaser. On January 23 there was a 5-in. opening, which did not become less than 5 in., and eventually opened to 6 in. Throughout the winter the size of deposit increased, but the hole never was less than 5 in. This was a 4-in. stack increased to 6 in.

Illustrations are shown in this issue of Sanitary Engineer of these experiments carried out in Winnipeg.

Neil Beaton, Saskatoon, asked if in the experiment with 6-in. and 8-in. pipes they were increased? The reply was in the negative.

He suggested they use discretion in this matter, and look into the increased cost. His opinion was that to avoid using increasers was cheaper and better for the man who owned the building, for the manufacturer, and for the plumbers. If they adopted this special fitting, it meant another to their list, and if they could get along without it, they would



away quicker. The less metal there was the warmer it would be, and less liable to freeze. The three terminals suggested by the Saskatoon branch would accommodate any roof in existence.

Mr. Fletcher, Calgary, while agreeing in the main with Mr. Nixon, said that if the increaser was made short within reason, the velocity of the air would not be retarded, and the warm air would escape before expanding.

Mr. Knechtel said it was agreed that the increaser was the great objection. The only time there was trouble was in winter. Why have an increaser at all? In this cold country the larger and deeper the increaser, the heavier the body of escaping air. There could be a gradual transition from 2 in. to 4 in., but why not make it 4 in., and not increase at the roof at all?

Mr. Fletcher asked if he might speak again. Mr. Smith gave permission, but



be cutting down the cost. He admitted, however, that these experiments clearly demonstrated that it was advisable to increase the size of pipe. He believed it would be hard to install in the ordinary roof.

Mr. Huntbach then moved that they adjourn for the ball game, and the motion carried.

TUESDAY MORNING SESSION.

A late start on Tuesday morning, due to the fact that copies of recommendations from various cities had to be made, resulted in a complete setback in the work, and when the convention adjourned for luncheon "Pipe Terminals" were still under discussion, and with everything indicating a full day's session on Thursday, meaning an extra day to complete the programme.

When pipe terminals were first considered on Monday afternoon it was ob-

served by the first speaker that the difference in practice in the various cities was so small little time need be taken up. However, it took two sessions to discuss the matter thoroughly, many of the delegates being in favor of an increaser, while the Saskatoon delegates had a fitting of their own design, which met with considerable favor. Eventually, on Mr. Mathias, of Regina, suggesting that too much time was being taken up, it was decided to leave it to a committee to bring in a recommendation on the subject, and for the whole meeting to vote on their decision, without any discussion.

The President opened the morning discussion by reiterating that there was little difference in practices; that it was only a question of how the terminals were finished off at the roof.

Mr. Knechtel drew attention to the fact that with a fixture on the side of wall, as it usually was, and after carry-



Mr. Fletcher drew attention to the fact that the Saskatoon suggestion required the making of a special fitting. Why not have a short increaser? He did not see why they should consider making a special fitting when a stock fitting would do.

George Wharton did not see the necessity of increasing even 4 in. to 6 in., though he would increase less than 4 in.

Mr. Knechtel told of two houses in Saskatoon, one with a 4-in. stack 18 in. above the roof, and one with a 6-in. increaser. The latter froze up the quicker, because it got no sun. He believed that lots depended on where the sun struck it.

Mr. Beaton—What is the length of the shortest increaser, 4 in. to 6 in.?

Mr. Anthes—8 to 9 inches.

Mr. Beaton—I maintain that the shortest increaser will make an unsightly job.

S. Bowcott, Edmonton, asked the president if his experiment with 8-in. pipe was carried through the roof and under the same conditions as the other pipes.

Good Evidence.

Mr. Smith replied "Yes," whereupon Mr. Bowcott said he did not think they



could have stronger grounds in favor of an increaser. Mr. Smith's experiments proved that a 6-in. increaser did not freeze up.

Mr. Knechtel—It will freeze up. It depends on the amount of iron above the roof.

Mr. McGrath, Saskatoon, who conceived the idea for the fitting suggested by the Saskatoon delegation, maintained there were no arguments in favor of the increaser. The only thing that had been proved was that it did not freeze if kept close to the roof. The manufacturer would tell them it cost more to make the Saskatoon fitting because of the slant in it. A man could not go on a roof and dress the lead up in less than 1½ hours, but with a slant piece of pipe he could do it in half an hour, for about 85 cents.

Mr. Robertson, Regina, objected to this, claiming that nothing should be adopted that reduced the amount of work for the plumber.



The President demurred, claiming they were discussing utility and not labor.

Mr. Huntsbach asked what experiments Saskatoon had carried out on their fitting to prove its efficiency.

A Hot Place.

Mr. Swain, St. Boniface, favored the increaser in cold climates like theirs, but he'd like to hear what the tropical districts had to say.

Voice—"Edmonton."

Mr. Lamson, of the Ashdown Hardware Co., asked permission to speak, and drew attention to the fact that Mr. Smith did not consider velocity of gas and percentage of moisture when making his tests.

This, replied Mr. Smith, was difficult for a plumbing inspector to carry out. They took as favorable tests as they could.

Mr. Mathias, Regina, having secured the floor, complimented Saskatoon on the way they had put their case. They were here to get a standard by-law. The

ing it 20 feet, what was the necessity for an increaser? He was speaking of smaller installations.

Mr. Ochampaugh, Edmonton, drew attention to the fact that in his house he had a 4 in. soil pipe before the increaser law came into force there, with an old-fashioned roof jack against it, and nothing covering the top of the pipe. A V-shaped plate had been broken out of the top of this pipe, and he never knew it to freeze. He just wondered whether this V helped any.

David Bullock, Edmonton, told of 4 in. and 2 in. stacks put in before the law was passed regarding increasers, which are within ¼ in. of the roof, and were never known to freeze over. They might be covered for a day with wet snow, but they opened again.

Old-fashioned Ways Good.

Mr. Taylor said that four or five years ago in Saskatoon they did not increase, and the old-fashioned type had not frozen over as much as the new ones.

terminal at the roof level had been agreed upon. The question was: Is it to be increased? He believed that an increaser was necessary. He asked them to sink matters of local feeling, and agree on something.

Mr. Fletcher, Calgary, then made a motion that the Winnipeg recommendation be adopted, with one or two changes, to read as follows:

Recommendation—"All terminals of soil waste and ventilating pipes shall be increased one size in diameter before passing through the roof of the premises, and no terminal be less than 3 inches, and all terminals of such pipes shall project to the outer air not more than 1 inch above on the high side where passing through a pitched roof, and not more than 2 inches above where passing through a flat roof, provided that the portion of all such pipe terminals above the roof have a hub of a size in proportion to which the pipe is increased, and the same shall be made weather-proof by means of a lead flashing. All such lead used for this purpose shall be in weight at least 6 pounds per square foot and shall be worked over and into the hub, with not less than 5 inches of cover on the roof on either side of the pipe terminals, and it shall be finished with a cast or wrought iron ring properly caulked into the hub, which shall in no case project above such terminal. All terminals of soil, waste, or ventilating pipes shall be located not less than 10 feet from or 2 feet above any window, door, or other opening in the same or adjoining premises, provided that in all cases a roof with a pitch of 6 inches or more in 12 inches shall be considered as a pitched roof."

Mr. McGrath asked that a committee



Messrs. McGrath, of Saskatoon, Oechampaugh, McFarlane, and Fletcher.

The convention then adjourned for lunch.

TUESDAY AFTERNOON SESSION.

When the members convened after dinner, Mr. Mathias, of the committee referred to above, was asked for their recommendation. While he had not drafted it in the right terms, the following is the sum and substance of what the committee agreed upon. Sanitary Engineer reproduces sketches of the pipe terminal decided upon, and another to show how nearly it resembled that proposed by the Saskatoon delegation:—"Terminals to be cut down to roof level and beveled to pitch angle, flashing to be made tight by a ring, 4 in. and over to be increased by 1 in., under 4 in. to be increased to 4 in."

Mr. Mathias remarked that it was practically a new fitting.

Mr. Bowcott—Then we have fallen in line with the suggestion of Saskatoon?

Mr. Smith—That's what it means regarding the bevel; but there is an increaser.

Mr. Huntbach moved, and Ald. Gothard seconded, that the report be adopted and be put into legal phraseology. The voting was in favor of this, with two dissentients, Swain of St. Boniface voting "oui," which the president said meant both ways. The delegate from St. Boniface then moved that the committee go thoroughly into the matter, and he was supported by Mr. Oechampaugh, who said it was a matter of importance to Edmonton.

Standardization.

The pipe terminals being settled with, the secretary read an article from April 15 issue of Sanitary Engineer, written by himself, dealing with the standardization of pipes and fittings, and spent much time explaining the drawings of suggested changes. On Mr. Swain moving that these changes be adopted, the president

said he hoped they would do nothing hasty. It would require years to perfect these fittings, and changes would require to be made gradually.

Mr. Taylor, Saskatoon, asked if these suggestions were feasible could not the manufacturers get busy and make individual fittings?

Mr. Smith—Yes, individual fittings; but I would not like to see them all go through without discussion and changes.

Mr. Lamson, of Ashdown's Hardware Co.—Would it be practical to standardize on a few fittings and add to them at other conventions? It would be a great hardship on the manufacturers to have to make new core boxes and other equipment. If they made a few changes that would be a benefit to the organization, and not hard on the manufacturers.

Mr. Smith—First we should standardize the pipe, as a standard soil pipe would fit any fitting, but not vice versa.

Mr. Vallance—Are you considering weight in these changes?

Mr. Smith—No, only the thickness.

Mr. Nash—It will be difficult to get the manufacturers to make pipe of the same thickness on both sides. It is sometimes $\frac{1}{4}$ in. on one side the pipe and 1-16 in. on the other.

Mr. Anthes (representing Anthes Foundry, Ltd.)—As far as the outside measurement is concerned, we can always get that right, but the inside depends on the core. You should insist on the outside measurement from $4\frac{3}{8}$ in. and inside to be no greater than 4 in. The depth and diameter of hub is a question the master plumbers must decide.

Explaining how pipe varied in thickness, Mr. Anthes said it was not so much due to sagging as to the iron floating when being cast, especially with 2-in. pipe.



New Pipes and Fittings.

Mr. Oechampaugh—Will it be a hardship on you manufacturers if we adopt three standard sizes of pipe and three fittings?

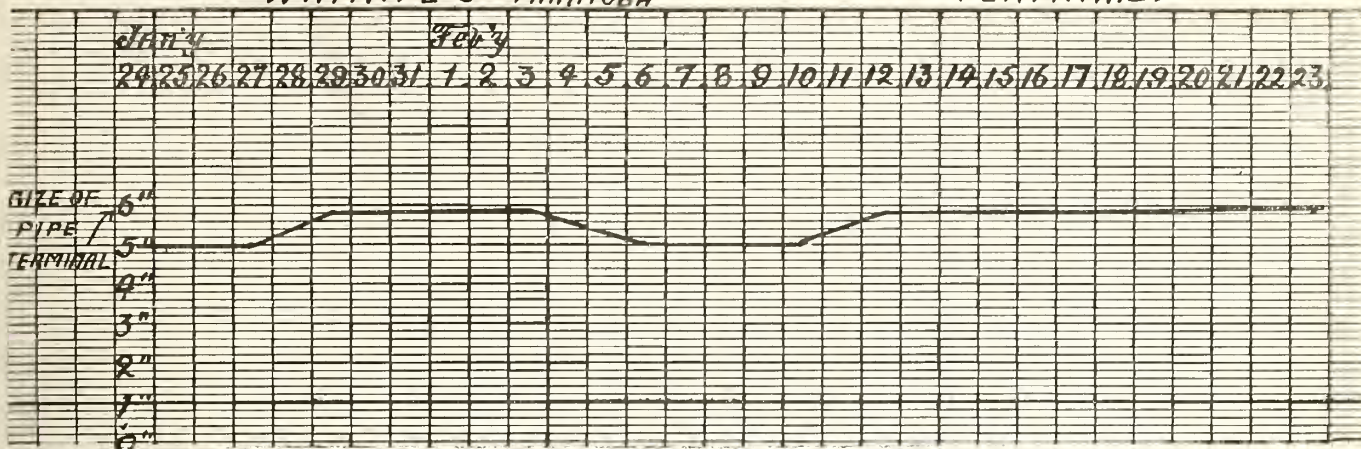


be appointed to bring in a recommendation, and this was agreed to on condition that there was no discussion.

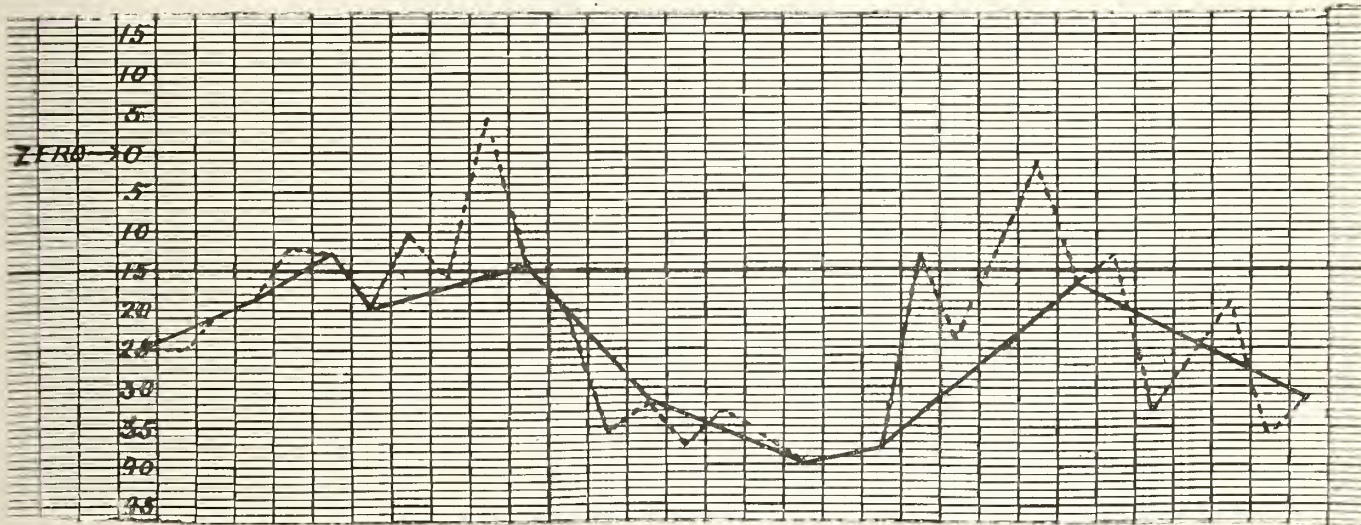
The following committee was then appointed:—Mr. Mathias (chairman) and

TEST TAKEN AT CIVIC CURLING RINK WINNIPEG MANITOBA

SPECIAL PIPE TERMINAL.



Showing closure by frost of a 6" soil pipe terminal, said pipe cut down close to roof with 1½ inches of pipe exposed above roof at high side and 7 inches at low side made weather-proof with a lead flashing worked into hub and finished with a cast iron ring caulked into hub.



Daily minimum temperature indicated by
Minimum temperature on days of inspection —————

Mr. Anthes replied that it would not affect them very much, as they had a plant in Winnipeg; but if the eastern manufacturers were there they would object strenuously.

Mr. Ochampaugh—When a manufacturer comes to us in the spirit that Mr. Anthes does, and offers to co-operate with us, such spirit should be commended. I move that we take up the standardization of three pipes and four fittings.

Mr. Lamson asked whether the representatives of cities had the power to accept changes before the by-laws had been readjusted in their district.

Mr. Huntbach (in the chair temporarily)—If it coincides with the provision of the by-law it will be all right.

Mr. Ochampaugh moved that a committee be appointed to confer with Mr. Anthes that night, the object being to secure the standardization of three pipes and four fittings.

The following committee was appointed to discuss the matter:—Messrs. Huntbach, Knechtel, Milligan, Fletcher, and McFarlane. The following were appointed to confer with Mr. Anthes:—Messrs. Nixon, Adam, Ochampaugh.

1915 Convention.

The question of next year's convention having been raised, Mr. Mathias, on behalf of the city of Regina, welcomed the convention to that city. It was the capital, and the Mayor had wired asking them to come. Mr. Robertson supported this.

Mr. Knechtel claimed that Saskatoon had a right to the next convention. They had no telegram, but the council had sent representatives, and there was a strong representation from the local union and school commissioner. They were having a builder's convention, and while the table was set, as it were, they might all be there.

Mr. Robertson pleaded for Regina.

When it came to a vote, Saskatoon got 25 and Regina 10 votes.

The next business taken up was the selection of officers for the ensuing year, and after much discussion, the following officers were elected:—

NEW OFFICERS ELECTED FOR THE YEAR 1914.

Mr. James Smith was re-elected president, to the satisfaction of everybody. Mr. McFarlane was also re-elected. The following are the other officers:—

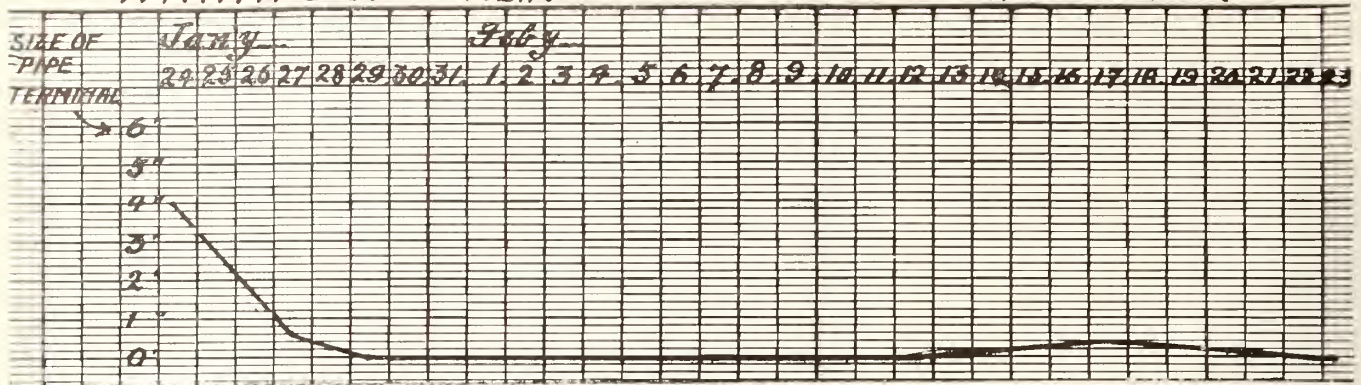
Vice-presidents—J. R. Huntbach, Edmonton; R. J. Swain, St. Boniface; S. Macnamara, Fort William; and J. G. Morgan, Vancouver.

Directors—H. D. Mathias, Regina; Neil Beaton, Saskatoon; and A. L. Milligan, Calgary.

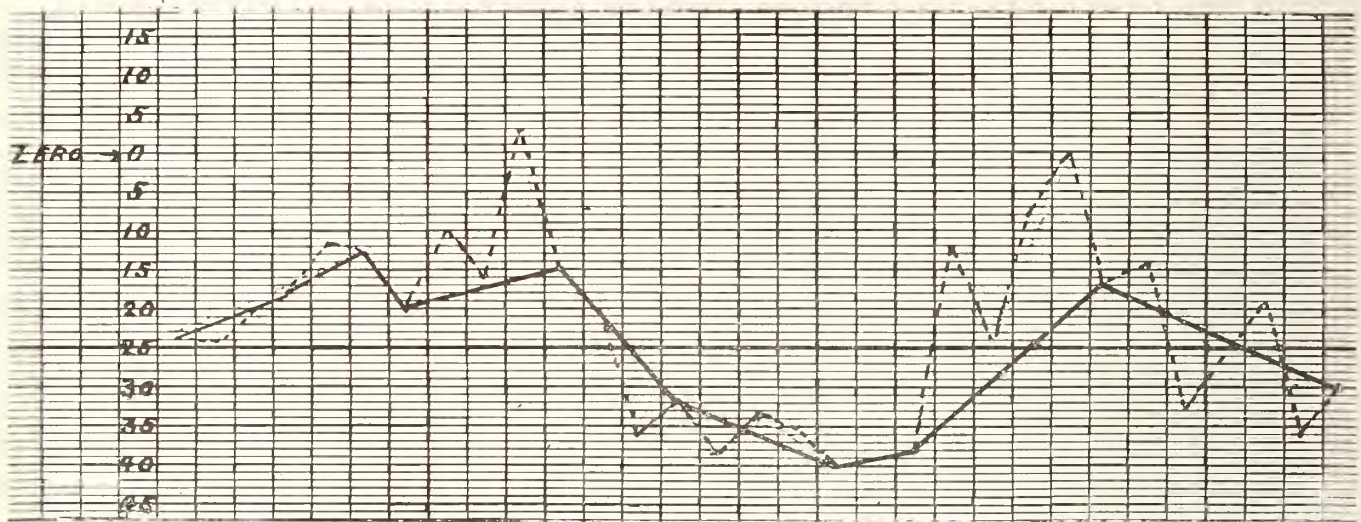
Publication Committee—H. C. Nixon, Saskatoon; James Adam, Regina; and Harry Nash, Edmonton.

TEST TAKEN AT GRAIN EXCHANGE
WINNIPEG, MANITOBA.

No 7. 6 INCH MAIN SOIL
PIPE STACK



Showing closure by frost of a 6" main soil pipe terminal with 1 ft. of pipe exposed above roof, no protection.



Daily minimum temperature indicated by -----
Minimum temperature on days of inspections —————

RECOMMENDATIONS OF EDMONTON COMMITTEE.

That the Following Clauses be Adopted at Edmonton, Alberta.

Clause 30.

All soil and waste pipe shall be of not less than the respective diameters set out below:

Main vertical soil pipe for not more than 30 fixtures in buildings of not more than six storeys, 4 in. pipe; main vertical soil pipe for not more than 60 fixtures not over ten storeys, 5 in. pipe; not over 100 fixtures, 6 in. pipe. Provided, however, that not more than 10 fixtures are required to connect with one main soil pipe on three or more floors above the fourth floor, otherwise special ventilation of the system shall be provided by intersecting vents which shall first have the approval of the plumbing inspector.

For the purpose of the above clause any fixture with an outlet of 3 in. or over and waste pipe shall constitute a fixture, otherwise two slop sinks shall be equal to one fixture.

Two urinals shall be equal to one fixture. Two sinks shall be equal to one fixture.

Two baths shall be equal to one fixture. Two laundry tubs shall be equal to one fixture.

Four basins shall be equal to one fixture. Main Vertical Waste Pipes.

For 12 sinks, tubs or baths 2 in. pipe. Over the above number 3 in. pipe. For 4 basins 1½ in. pipe. Above 4 and not more than 24, 2 in. pipe. Provided that a clean-out is installed on each sink or basin stack at intervals of not more than every 2nd floor and same shall be easily accessible without the use of tools, for raising floor boards, etc.

Horizontal Branch Waste Pipes.

For W. C.'s 4 in., not more than 16 on one branch.

For slop hoppers or fixtures with 3 in. outlet and waste not more than 16 on one branch.

For urinals, slop sinks 2 in. maximum, No. 6.

For baths, sinks, tubs, foot or sitz baths, 1½ in., maximum No. 2.

For basins, 1¼ in., maximum No. 2.

34. All soil, waste and ventilating pipes shall be located inside the premises:

and all roof terminals of such pipes shall be located not less than 10 feet distant from any opening door, window, etc., in the same or any adjoining premises, nor shall a perpendicular from any roof terminal to the grade be nearer than 10 ft., to the side line of lot; the roof terminal shall project 1 in. and no more above the highest point on the roof where such roof terminal intersects the roof.

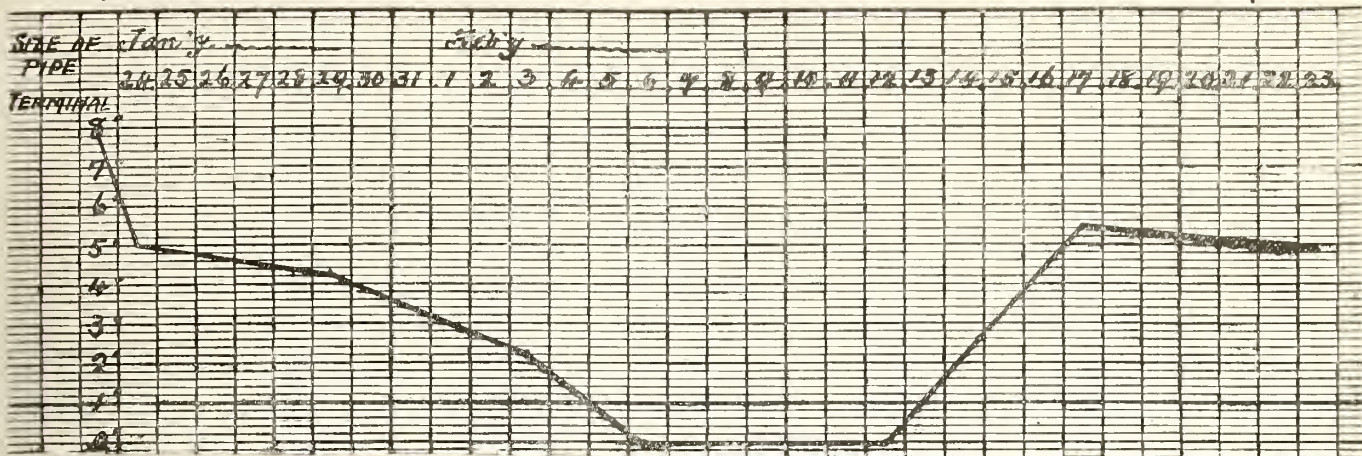
35. All vent pipes of 4 in. diameter or less shall be increased at least 2 in. before passing through roof and no roof terminal shall be less than 4 in. where same passes through roof and shall terminate with a hub and shall be flashed with sheet lead turned down and caulked into the hub.

37. (F) Rain water traps shall be placed inside the building and beneath the basement floor, same shall be provided with a clean-out on the house side of the trap which shall be extended so as to be level with the basement floor.

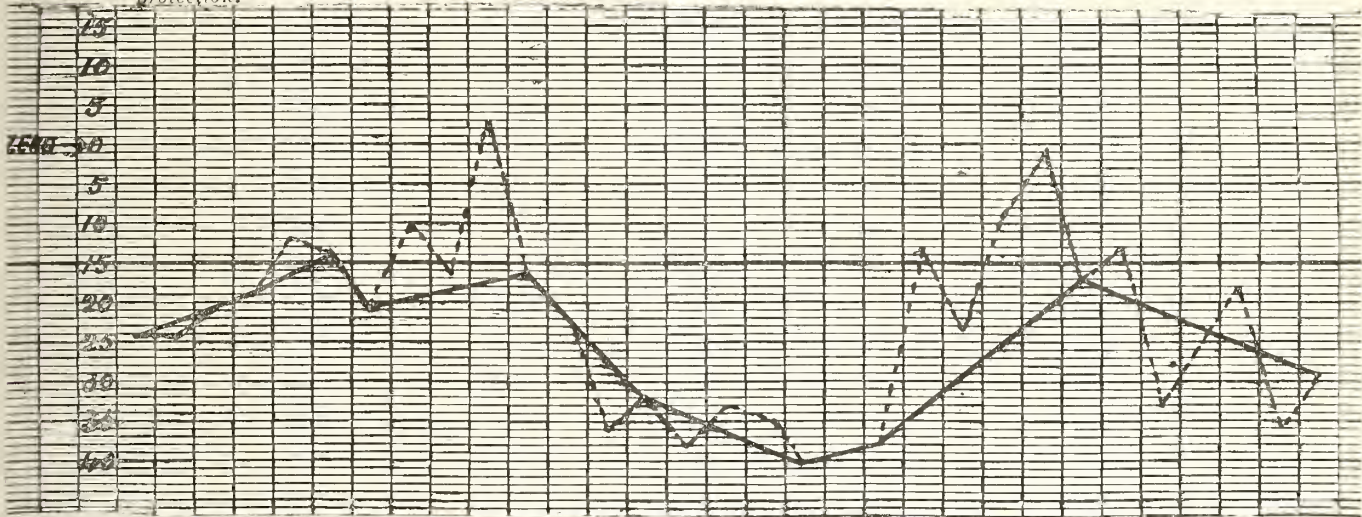
Rain water leader and cellar drainage traps shall be of iron, not less in diameter than 4 in., and shall have a water seal of at least 4 in.

TEST TAKEN AT GRAIN EXCHANGE WINNIPEG — MANITOBA.

NO 8. INCH SOIL PIPE STACK



Showing closure by frost of an 8" main soil pipe terminal, with 1 ft. of pipe exposed above roof, no protection.



Daily minimum temperature indicated by -----
Minimum temperature on days of inspections —————

PROVINCIAL PLUMBING BY-LAWS. Recommendations of Saskatoon Com- mittee.

Examination of Plumbers.

"That no person, firm or corporation shall act as, or do any work as a master or journeyman plumber unless he or they have a certificate, which certificate shall only be obtained after the candidate shall have passed a satisfactory and practical examination. It shall be sufficient if one member of a firm hold a certificate. This certificate shall be good for any part of the province in which it is issued."

"One man shall be appointed by each province as chief examiner of plumbing, who shall act as clerk to the provincial Examination Board and shall visit the various centres at stated intervals for the purpose of holding examinations."

Examination Board.

"There shall be an examination Board in each of the examination districts of the province (N.B.—We find that Saskatchewan will divide up into

twelve examination districts composed of an average of 46 rural municipalities) with headquarters in the principal town or city in the district, consisting of the local plumbing inspector, one master and one journeyman plumber of the town or city, which board shall have power to take applications for examination and also to give permits to those they think qualified to work until such time that they can be examined. The application shall be immediately forwarded to the chief examiner and the permits given shall be subject to his vote, should any cause therefor exist.

"The persons to serve on these local examination boards shall be recommended by the City Councils of over 10,000 population, or where none exist in the district the three chief towns of the district, having sewer and water."

Appointment of Examiners.

"The appointments of examiners will be made from these recommendations by the Provincial Board of Health, who shall have the power to revoke any cer-

tificate for infractions of the by-laws and to enforce the penalties hereinafter set forth.

"The application fees shall be held by the local plumbing inspectors until examinations, when they shall be paid over to the chief examiner.

"Seeing that examination without inspection in conjunction is a farce, we recommend that all cities of 10,000 population or over in any examination district, a plumbing inspector shall be maintained by that district, who shall locate as determined by the Provincial Board of Health.

"Where there is a city of 10,000 population or over, within the examination district, the Provincial Board of Health may approve of a joint appointment of the city inspector or inspectors for the city and the outside district.

"The Saskatoon Committee have searched the plumbing examination ordinances of every state, having such, in the country south of the international border and have used their best endeavors to

pick the best out of them and modify them to Canadian conditions. We realize that there is at least one anomaly for the convention to thresh out.

"The clauses relating to inspection are, of course, incomplete, by themselves."

Cut Out Roof Jack.

"That all vent pipes terminate not more than one inch above the pitch of roof on the higher side and have a lead flashing turned down one inch all round inside the top of pipe dressed in tight and secured with a malleable iron ring.

"All vent pipes to be carried up to roof and to terminate the same size unless the vent line is less than four inches in diameter, when it shall be increased to four inches at least three feet below roof.

"We claim that by the elimination of the roof jack and increaser and the consequent decreased surface, we lessen the radiation and therefore the deposition of moisture which congeals thereon.

Reduce Number of Roof Terminals.

"All branch vents shall be carried back into the main stack before passing through roof. This will reduce the number of roof terminals."

A Separate Vent Pipe Shall Not Be Necessary.

"A separate vent not required where the inlet of the bath trap is located not more than 20 inches from any wash-basin waste; the said waste shall act as bath trap vent provided that the water line of the bath trap is not more than 1½ inches above the bottom of waste pipe at point of junction, and that the said junction is made at an angle of 45 degrees in the direction of flow.

"Where closets are set in batteries, a 2-inch vent shall be taken off the drain pipe after every second closet counting from the soil stack, or outgo end.

"Where there is more than one closet on a floor above, the nearest closet to the soil stack shall be vented in addition, as near to the trap of the fixture as possible. In no case shall branches for closets measure more than 24 inches total length from centre of drain to floor level without a vent.

"The fall to drains of batteries of closets shall not be more nor less than one-eighth of an inch to the foot run were laid on concrete floors.

"There shall be a back vent or relief vent stack carried up from the drain into the main vent stack of batteries of closets.

Sizes of Drain, Soil and Waste Pipes.

"That 3-inch C.I. drain and soil pipes may be used when not more than two closets and four other waste pipes of 1½-inch diameter or their equivalent are installed thereon. The vent stack must be increased to four inches below the point where the branch vents enter

it. All traps must be vented to prevent syphonage and back pressure.

"The outlets from closet traps measure only three inches and the pipes will be scoured clean by the closet discharges.

"That the sizes of house drains and soil pipes shall be determined by the number of soil and waste pipes discharging thereinto according to the following table:

Drain or soil pipe.	No. of 1½-in. wastes or their equivalent.
3 inches int. diameter	12
4 " "	72
5 " "	120
6 " "	200
7 " "	260
8 " "	350

"One closet or slop sink shall be considered equal to four 1½-in. waste pipes.

"That the sizes and lengths of vent pipes shall be determined by the number and sizes of traps installed according to the following table:

Int. Dia. of vent pipe.	Max. length in ft.	No. and sizes of traps that may be vented thereby.
1¼"	20"	1 trap of 1¼" dia.
1½"	25"	1 to 4 traps of 1¼" dia.
1½"	40"	1 trap of 3" dia.
2"	50"	1 to 3 traps of 3" to 4" dia.
3"	100"	3 to 12 traps of 3" to 4" dia.
4"	200"	13 to 24 traps of 3" to 4" dia.
5"	300"	25 to 40 traps of 3" to 4" dia.
6"	400"	41 to 70 traps of 3" to 4" dia.

"Four traps of 1½-in. diameter shall be considered equal to one of three inches to four inches for computing sizes of vents.

"That where branch drains enter main drains 'Y's and eighth bends shall be used, but where 3-in. or 4-in. horizontal soil branches enter vertical stacks of larger diameter 'T Y's shall be used.



E. T. NEEDHAM.
Representing Canadian Wolverine Co., Chatham, at the convention recently held in Edmonton.

"That slop sinks shall be treated and fixed as if they were W.C.'s.

"That rain water leaders shall be always disconnected from sewers and plumbing fixtures and not used as vents. That is to say: that where there is no separate storm water sewer, they shall be trapped before they enter the house drain. No vents from plumbing fixtures shall be connected to any rain water leader.

"Where vents are carried into rain water leaders, storm water may flood the plumbing fixtures in case of a chokage of the rain water drain or trap.

Geo. Gillespie Taylor, Chairman,
Horace C. Niseon, Secretary,
of the Saskatoon Committee."

Delegates to the Convention.

James Smith, Winnipeg; E. P. Fletcher, Calgary; J. R. Huntbach, Edmonton; G. T. Taylor, Saskatoon; Wm. McFarlane, Winnipeg; R. J. Swan, St. Boniface; H. D. Mathias, Regina; Harry

Nash, Edmonton; J. T. J. Vallance, Lethbridge; George Wharton, Winnipeg; John J. McGrath, Saskatoon; John Stevenson, Saskatoon; H. J. McGrath, Regina; J. B. Rogers, Calgary; James Robertson, Regina; James Adam, Regina; E. T. Needham, rep. Canadian Wolverine Co.; A. L. Mulligan, Calgary; Horace C. Nixon, Saskatoon; Ald. G. L. Gothard, Wetaskiwin; L. L. Anthes, representing the Anthes Foundry Co., Ltd.; R. Blackwood, representing Saskatoon School Board; Duncan Campbell, Medicine Hat; W. C. Ochampaugh, Edmonton; Jasper M. Holt, Edmonton; Neil Beaton, Saskatoon; James Maxwell, Edmonton; W. Carse, Edmonton; E. B. Plewes, Winnipeg; G. H. McKnight, Edmonton; N. A. McIvor, Edmonton; James F. Erskine, Edmonton; F. S. Lamson, rep. the Ashdown Hardware Co.; S. Bowcott of Bowcott, Dean and Roberts, Edmonton.

CONVENTION NOTES.

The Winnipeg delegates conducted themselves like ministers' sons, it being Sunday.

J. F. Erskine represented the Great West Supply Co., Edmonton, at the convention.

The first days' session opened to the music of escaping steam from the surrounding radiators.

E. B. Plewes, Winnipeg representative of the Amherst Foundry, accompanied

the Winnipeg delegates to the convention.

R. J. Swain, chief plumbing inspector of St. Boniface, was the sole representative from that city, and came up with the Winnipeg delegates.

Considerable satisfaction was expressed by many when E. P. Fletcher, chief plumbing inspector of Calgary, put in an appearance.

Wm. McFarlane, secretary of the Institute, read the minutes on the first day's convention with the eloquence of a statesman.

Edmonton delegates reported that business in that city has shown considerable life during the past week. Saskatoon delegates brought the same good news.

On the Winnipeg train it was moved and seconded that the president be censured for chartering a car with unsanitary fittings. It was equipped with a pan closet.

The Compound Injector & Specialty Co., 419-421 North Laramer Ave., Chicago, had some drainage basins and fittings on show in the convention hall, in which the delegates showed considerable interest.

L. Anthes, of the Anthes Foundry, Limited, was early on hand, armed with a big roll of blue-prints. He represented the manufacturers who were interested in the subjects to be discussed.

James Smith, president of the Institute, on calling the convention to order, on Monday morning, expressed pleasure at the large number present, adding that where they lacked in quantity they made up in quality.

At the Monday luncheon, while Ald. Clark was speaking, L. L. Anthes got a craving for olives. F. S. Lamson, representing J. H. Ashdown Hardware Co., passed him several dishes of them, until the display was embarrassing.

Amongst those representing the manufacturers at the convention of the Canadian Institute of Sanitary Engineers were J. Berryman, general manager of Metals, Limited, Calgary, and Mr. Rioridan, manager of Standard Sanitary Mfg. Co., Ltd., Toronto.

Saskatoon sent its chief plumbing inspector, D. G. Taylor, and Robert Blackwood, school board commissioner, the Master Plumbers' Association being represented by N. Beaton and G. Edgar Knechtel. They were instructed by the council to get a uniform by-law pushed through, and to put into law as soon as possible. Saskatoon has been considering a by-law some time, but put it off until this convention. Their by-law is O.K. with the exception of the standardization of fittings, which they want arranged. Saskatoon joined the Winnipeg delegates at Saskatoon in a special car on Sunday, prior to the convention.

LETTER OF APPRECIATION.

Editor Sanitary Engineer,—

Enclosed please find \$1 to pay for "Sanitary Engineer" for the year. I must tell you that I have been pleased with the books in the past year. It fills a long felt want and should be in every shop, so that helpers as well as journeymen might be helped to do better work, which would reflect greater credit to the profession and better satisfaction to the customer.

*P. H. C.,
St. John, N.B.*

GENERAL NOTES.

Ellis and Grogan, Calgary, who have been representing an English firm for a year, are now carrying full lines of plumbing supplies, and are contemplating extending their premises.

Western Supplies, Limited, Edmonton, jobbers, are erecting a six-storey building, and already have the foundation excavated.



GAS HEATING SYSTEMS.

The Scientific Heater Company of Cleveland, Ohio, are issuing a splendid illustrated catalogue of their heaters. They make some very remarkable claims for their gas heating furnaces, as well as heaters. Readers interested in such appliances should write to the Scientific Heater Co. for this book.



NEW ALUMINUM ALLOY.

A new alloy of exceptional lightness, considerable mechanical strength, and freedom from electrolytic action is stated to be gaining popularity in British engineering circles. It is named "ivanium."

This alloy, obviously one of aluminum with one or more metals occupying positions relatively near to aluminum in their electro-chemical properties, is only 2½ per cent. heavier than pure aluminum. It is stated to have the property of retaining its hardness after being subjected to heat and of being non-magnetic. When polished the surface remains bright indefinitely.

Castings made in ivanium are stated to be equal in finish to the finest gunmetal. The alloy does not clog a file, and it can be screwed, tapped, milled, and soldered with ease. Joints soldered together are stated to be as strong as the original metal. The melting point is low, about 300 degs. centigrade, and the alloy is claimed to be a useful deoxidant.

WHAT SHALL WE DRINK?

Dr. Hastings' Hope.

Dr. Hastings, Medical Officer of Health, Toronto, in April Health Bulletin:—

"It is expected that the use of chloride of lime in the city water will be shortly discontinued for good."

Dr. Nasmith's Warning.

Dr. Geo. Nasmith, Director of Laboratories, to the City Council yesterday:—

"If chlorination were stopped to-day there would be a typhoid outbreak."

Dr. Hodgetts' View.

Evidence of Dr. Chas. A. Hodgetts before Conservation Commission, Ottawa, March 25, 1914:—

"American engineers, thinking they had a great thing, came along and introduced the hypochlorite treatment in all water supplies, and this is a matter I feel very strongly on as a Canadian."

"If you are pouring raw sewage into the source of your water supply and then treating it with hypo it is all humbug to say you are safe. I am telling you, gentlemen, the actual facts."

"Over every tap through which such doped water is supplied should be placed a label 'Poison,' and the Government or municipality should insist upon such a label being there. The people of this country rely upon a broken reed every time they rely upon the hypochlorite treatment of their water supply."

WANTED

WANTED—POSITION AS MANAGER (OR partnership) by a practical plumber, R.P.C., England, with 4 years Canadian experience. Apply Box 85, Sanitary Engineer & Steamfitter, Toronto. (10)

WANTED—PLUMBERS WITH TECHNICAL knowledge to act as representative for the Anglo-American Sanitary Correspondence College, the institution which has the endorsement of all recognized bodies. Whole or spare time. Address Representative, Anglo-American Sanitary Correspondence College, 10-12 W. Ontario St., Chicago, Ill. (10)

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Plumber and Steamfitter of Canada

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Architects, etc.

TORONTO, MAY 15, 1914

CONVENTION OF THE CANADIAN INSTITUTE OF SANITARY ENGINEERS.

THIS convention which was recently held in Edmonton, is one which will be long remembered by every member of the craft, whether present or not, providing the absent craftsman takes the time to read the report which appears in this issue of Sanitary Engineer. Those members present showed what has really been done since last convention. The various members and committees have certainly made history, and have also laid out a hard year's work for themselves. Every craftsman throughout Canada will remember some of the changes which are proposed by the members present at this convention as being of very vital importance.



STANDARDIZATION OF SOIL PIPE AND FITTINGS.

ANOTHER question of importance from the standpoint of the West, is that of standardization of soil pipe and fittings, reports of which were published in our last issue. This question is one of more vital importance to those in the Western provinces than to us in the east. Once in a while a fitting is found to be uneven, but on the whole we do not experience a great deal of trouble. Of course one feature of this question, that of fittings being too small in radius, such as the branch of a T, Y, and bends as well as offsets, is important throughout the whole Dominion; but this has all been brought about by a matter of dollars and cents, which should not be. It is questionable whether more time is not lost in making joints tight by the using of short rather than long radius fittings. Nothing is more discouraging to a sanitary engineer than trying to make a good joint on a long offset, when the radius is short at the bend. Therefore it is very encouraging to see there is a movement on foot to standardize such commodities as are being used in the trade.

THE VENTING QUESTION.

THIS question of venting and back-venting received much attention too, by members of the Canadian Institute of Sanitary Engineers at their convention. The writer has long contended that venting and back-venting under any and every condition is totally unnecessary, and in various editorials the question has been raised. The fact that it was given some attention years ago goes to prove that we are taking note. In the year 1899 the writer took the question up through the daily press and asked, why a w.e. required to be backvented if the lavatory and bath traps were backvented? The conditions referred to were that of a single house with one bathroom only, with w.e., lavatory and bath as the only fixtures of the stack except a sink on the floor below, but the question never received a reply except in a scornful way. To-day it is very encouraging to see that the craft are beginning to think more, or in other words, "saying more though talking less."



THE PIPE TERMINAL.

THE pipe terminal question received a splendid hearing and from the standpoint of the Western Provinces this is a very vital question. It is also more important in our Eastern Provinces if we only took the matter up as earnestly as have our brother craftsmen in the West.

The data received and submitted in this issue of Sanitary Engineer are real history. Never before have our readers had such information given them which is the result of actual tests, and never before have they had photographs to back up these tests which have been performed by the Winnipeg craft. In giving such information regarding pipe terminals, Winnipeg has given to Canada something which in value cannot be overestimated.

THE COMING CONVENTION.

NOW that we are discussing more or less convention work, or shall we say, work done during the past year and reported at the recent convention, let us sound a note or two for still another convention, that of the National Society of Domestic Sanitary and Heating Engineers, which is to be held at Ottawa on June 9, 10 and 11. This too, we know, is to be one of great importance, and several matters are to be taken up which will have bearing on the future welfare of the craft, such as Dominion sanitary laws, Provincial Health Act, Workmen's Compensation Act, the Organization of Branches in various provinces, and the Act dealing with the mountings and setting of steam boilers.

All these subjects are of great interest and no doubt when taken up at the coming convention in Ottawa will bring results of a satisfactory nature.

The Dominion Government will no doubt see the advisability of creating a Federal Board of Health in the near future. Just imagine what could be accomplished for the craft and sanitation as a whole if such a board existed. Provincial and local matters could be taken up and studied in an unbiased way and data could be furnished to the craft in such a way as to keep problems of sanitation ever progressing instead of as at present. Thousands of dollars have been wasted by one city and another copying each other's plumbing by-laws more or less, when climatic and other conditions were altogether different. The wholesale back-venting of traps has been overdone in almost every city in Canada.

On the other hand there have been cases where vents have been necessary but not installed. So that it can be plainly seen that a Federal Board of Health, with a sanitary engineering department would solve a great deal of the trouble now experienced all over the Dominion.



EDITORIAL COMMENTS.

Don't forget to read the report of the Canadian Institute of Sanitary Engineers' Convention, which appears in this issue of Sanitary Engineer.

* * *

And in reading, don't simply read.

* * *

But read, mark, learn and inwardly digest.

* * *

Having done so,

* * *

Look out for a full programme of what will take place at the convention to be held at Ottawa June 9, 10 and 11.

* * *

If you can be present make a point to be a ready listener and a willing speaker. Don't go to take all in without giving in return.

* * *

And remember you are in the capital of the Dominion of Canada, where everything is both said and done, and when done counts for either good or bad.

* * *

Ask the boys in Ottawa if their new plumbing by-laws are completed.

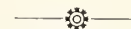
* * *

And if they're up-to-date, or otherwise.

The Business Outlook

ALTHOUGH it cannot be said that business is booming in the hardware line, there is every reason to believe the conditions are gradually growing better and that business is showing a steady improvement. The general feeling is that the period of depression through which the country has been passing was needed to check private and public extravagance. Reports from the larger industries indicate that orders have slightly improved. Speculation seems to be now absent from business generally and with the elimination of such a deterrent to healthy conditions, confidence and activity should derive encouragement. There is still evidence of a determination on the part of the people as a whole to liquidate and economize, but it is a good sign and puts business on a basis that is exceedingly promising. Reports from the agricultural districts are extremely encouraging and should be a great aid in establishing confidence. Rural and country town business is particularly healthy and hardware merchants in many of the smaller places throughout Ontario and the Eastern provinces state that their business so far this year compares favorably with the business of last, and previous years. In some cases the volume of business has increased. Hardware jobbers report that business is holding up well. Paint manufacturers have secured good business from the retail hardwaremen. The weather of the past two weeks has been unfavorable for good business, but with an improvement in weather conditions the hardware trade should be stimulated to a great extent.

A considerable amount of building is now under way, and the demand for building material is improving. Summer goods are beginning to move and will move rapidly with the advent of warmer weather. Quite a number of price changes have occurred recently and in most cases have been in a downward direction. Collections are showing improvement.



PLAN YOUR OWN WORK.

THIS was one of the many topics taken up between members of the craft at the recent Provincial Convention. The subject of plan drawing was well brought out, and scores of instances could be cited which had reflected no credit upon the craft. The need for more technical knowledge was taken up, and also the need that members study the art of laying out their work on paper before beginning to install it. Therefore, in our next issue we will endeavor to put before our readers a few simple methods as to how to draw a plan for an imaginary house heating system; how to describe the various connections, and then finally take up the quantity of material, all of which will be free from highly technical phraseology. Another object we have in view when giving this article will be that of better enabling those engaged in the trade to figure out the actual cost of a job, as no doubt if one had a plan or sketch of a proposed installation, the work of giving fairer quotations to both customer and craftsman would be greatly simplified.

A Plea for Industrial Efficiency in Sanitary and Heating Engineers

Showing What Has Been Actually Accomplished Along the Lines of Technical Education in London, Ontario, and What is Necessary to Raise the Standard of the Trade to a Higher and More Dignified Position.

By J. R. Haslett,
Lecturer and Instructor in Sanitary Engineering, London Industrial and Art Schools.

THE industrial efficiency of the individual worker is of value, not merely to himself, to the particular trade at which he works, to the community in which he lives, but also to the nation as a whole.

Canada as yet has not become remarkable for the high standard of her sanitary engineers, and it is openly admitted that the scarcity of this particular kind of craftsman is due to the fact that the boys are not going to the trade to any extent, and those who do, in many instances leave within two years. The reason for this in many cases is that the boy and his parents, believing that there isn't much to learn and that the joy of big wages would soon come regularly once a week, have concluded to try and get "Willie" in on the ground floor.

Now, the master should at the outset be fair and honest with the applicant and make him understand that there is a great deal to learn and remember, and that the path of the trade is as often strewn with thorns as roses. But it seems to me that, while many masters profess to agree with the writer here, their laxity in requiring certain educational standing of boys entering the trade seems to indicate that they themselves do not clearly grasp the fact that this good old trade can only be acquired by boys who start in with a fairly good education. They should have at least high school entrance certificates. I might mention here, that I have been asked by the editor of this trade paper to give my ideas on Industrial Training and Technical Education, and I am not going to apologize for what I have so far said or will say further on.

Of course I know it is difficult to get the fellow who has gone to high school or Collegiate very long, because there is a something unfortunate about the atmosphere of our high schools that seems to give the boy an idea that he is just a little above doing any manual labor. The best time to catch a boy is just after he has passed his Entrance—before he has caught the "epidemic."

Now I think it would be a good move if the Ontario Society of Domestic Sanitary and Heating Engineers would in-



J. R. Haslett, London.

sist on a boy having his entrance certificate before they employ him.

In my position, as lecturer and instructor having charge of the sanitary and heating engineering class at the London Industrial and Art School, I find a great deal of difference between the education some boys have compared with that of others. Some of my students start out with such a meagre amount of schooling that they really do not know what a square foot is, while others can compute the area of a circle before the term starts. Just imagine the up-hill job on the one hand, and the pleasure on the other.

Now before any student can handle tools at all, he must study physics and applied science, and acquaint himself to my satisfaction for one night a week for four months.

The fellow without the education might be a very decent, willing worker, but lacking the schooling he can only go so far, and it is only right to say to him: "You must have certain qualifications before you can be taken on; consult the principal of the Industrial School, he will direct you to the various

classes in which you can become properly fitted to begin."

Did it ever occur to you that the boy is not always to blame for leaving the trade when he has been at it a while?

Did you ever notice that many bosses do not undertake to teach a boy anything, except to run here and there for materials and tools?

I have had boys in my class who were over a year at the business when they entered the class and had never had a tool in their hands.

It might be well to explain here that the Plumbing Class at London is composed of only bonafide apprentices and workers at the business; all others are barred, excepting boys who, on their word of honor, signify their intention of going to the trade as soon as a position is open; this is a safeguard against tinsmiths, blacksmiths and those having the proclivities of handy men who want to take up lead work and crowd the class to the detriment and disgust of the chaps who are working at the trade.

The primary object of the Plumbing Class is to help the young plumber to become well versed in his business, to his own individual advantage, to be a credit to the craft he represents, to be a valuable citizen in the community in which he lives, and that eventually the scheme may enlarge itself that our country may have a reputation for producing tradesmen of exceptional skill and intelligence.

The writer being the son of a practical plumber of fifty-four years' active service at the trade, and having had twenty-five years' experience himself, feels that these night classes are going to fill a great gap. The trade is going to receive an uplift by this means that it can get in no other way at present.

The question was asked at our recent convention in Toronto, "Will the boys attend and will they stick and appreciate the opportunity if we go to the trouble of forming a class?" My answer is, decidedly yes. The manner in which the students have taken hold in the London class has been more than gratifying. It is a common thing to hear the expression, "I don't know any place where two hours fly so quickly." And all the

students express themselves as feeling thankful to the Department for affording the opportunity there obtained.

The class opens at 7.30 p.m. and closes at 9.30 p.m., and the majority are there before the opening time, ready to put in every minute. Some, of course, have to work late for their employers occasionally, which detains them for part of the evening. The average attendance is from 90 to 95 per cent. of the members on the roll, which speaks for itself.

Why other cities, having the same opportunity as London, do not have classes of instruction for plumbing is because the employers are content to find fault and sit down and fold their hands and do nothing to help the situation. The trade has been an object of scorn for years just because the men in it have not had the courage to inject dignity into it.

My idea is that the profession to which we belong is an honorable one, and the member of the craft who does not do his share toward demanding the respect of the general public is guilty of a neglect of duty. Remember, I am well aware of the fact that the trade is bristling with men of intelligence, and who use their faculties to advantage in many ways, and who in many cases become prominent citizens; but what are they doing to help those coming on? If they are using their young help as "hewers of wood and carriers of water" and are not taking any pride in the development of craftsmen, they are thieves of the worst type, because they are stealing the bright young days of happy youth wherein boys should be watchfully instructed in the use of their hands and in the storing of their minds.

The employer who receives into his tender care and keeping an apprentice,

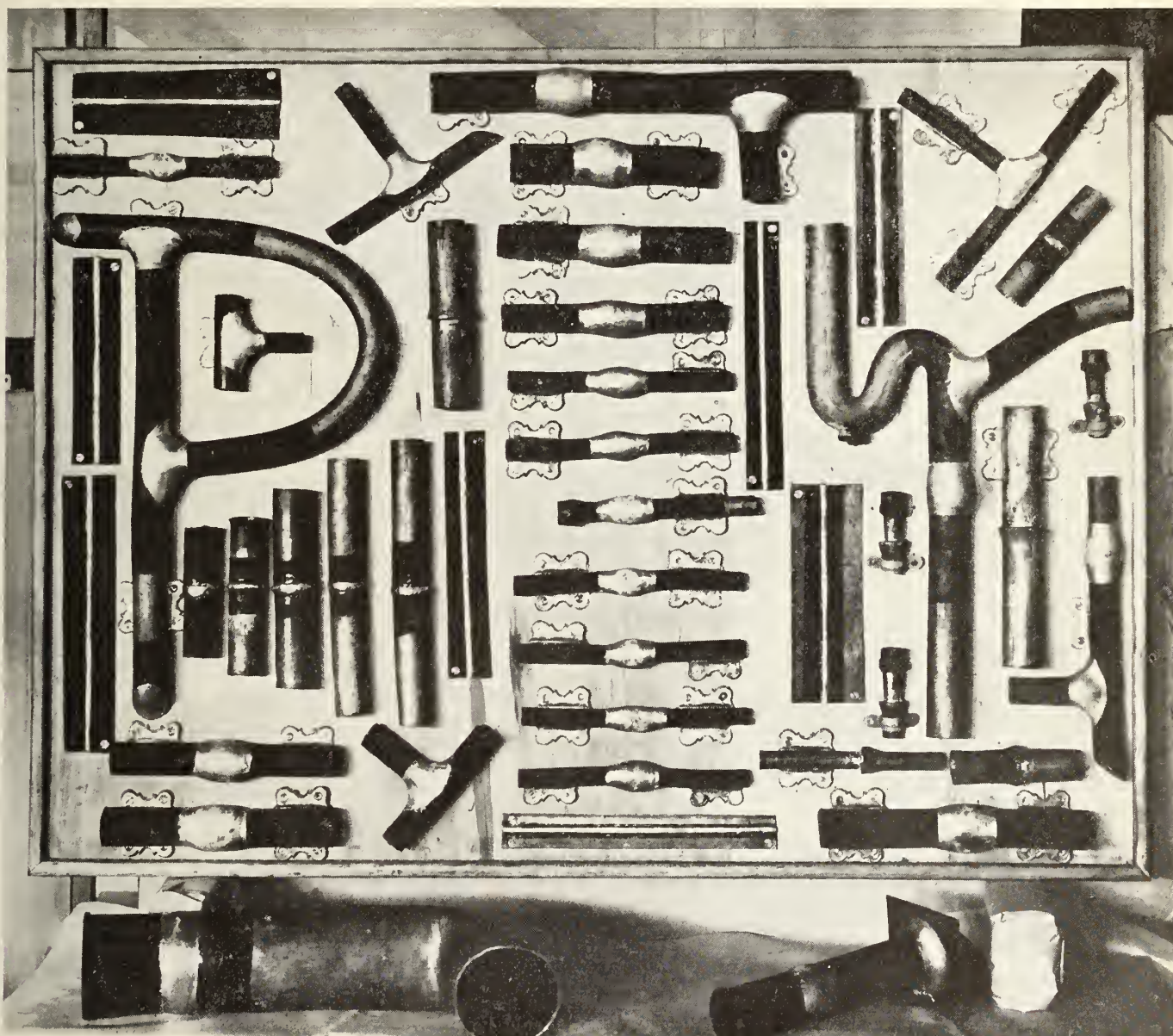
takes unto himself an immeasurable responsibility.

Again, the man on the street is not interested in our trade, and if you are going to have a Plumbing Class in your city, the members of the craft in that city must raise their heads and demand it.

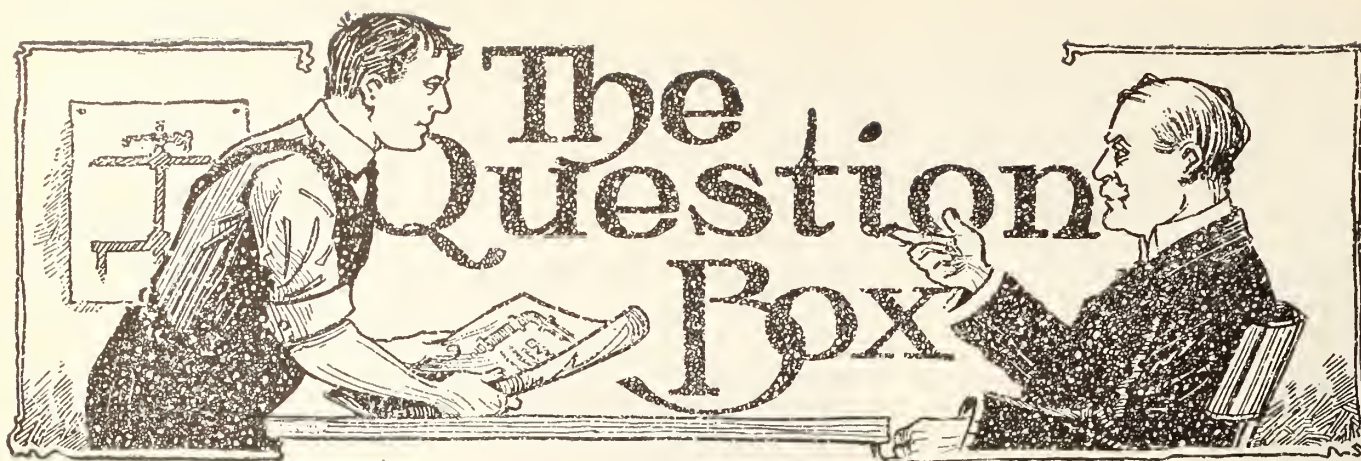
Just fancy, the Government supporting night classes in millinery, woodworking, domestic science, dressmaking, blacksmithing, forge work, machine work, carving, and in other lines of work, and yet no Plumbing Class is found except at London. These other trades would never have had classes if they had not been demanded by those associated with the different trades represented, and you will have no Plumbing Class until you demand it.

If the Advisory Board of your local Board of Education does not comply

(Continued on page 34.)



Display of work done by the students attending the Technical School, London, Ontario. These are either working apprentices now practising the trade or who intend taking Sanitary Engineering up as a calling.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

HOW IS SMUDGE MADE?

Editor Sanitary Engineer: Please inform me in your next issue of Sanitary Engineer how to make the black paint used when making wiped joints.

J. P. R.

Replying to J. P. R., the black paint he refers to is known as "plumbers' smudge," and is made by mixing dry lampblack and thin glue together. The method adopted to make this smudge is: Take a packet of lampblack and add enough hot water so as to bring it to the consistency of thin paint; see that any lumps are broken up, then get a small quantity of white fish glue and put it into the mixture and place over a slow flame, stirring all the time, until the glue is dissolved. Do not let it boil. Then try the mixture a few times on some lead pipe. If the smudge peels off, there is too much glue in it. If it rubs off there is not enough glue in. To make good smudge requires actual practice.—Editor.



WATER GETS TOO HOT.

Editor Sanitary Engineer: Some time ago I installed a hot water system and instead of using a boiler I put coils in a bake oven, but found the water got so hot, and would drive the hot water into the cold water pipes. There is a down standpipe and in the morning there is a heavy pressure but this is reduced by the afternoon. Can you advise what can be done to overcome the trouble? I could not use a lever blow-off valve on that account. J. P. R.

In reply to this question of J. P. R.'s we would state that without a few more particulars we cannot assist him very much, and would therefore ask him to furnish us with the following data: Is the system referred to one comprising coils and radiators for heating purposes, or is it simply a hot water system for domestic hot water supply?—Editor.

IRON CEMENT OR RUST JOINTS.

Editor Sanitary Engineer.—I have come across an old-style greenhouse heating job where cast iron pipe is in use, and I am asked to extend several sections of the cast iron with ordinary threaded joints, and am at a loss how to make a satisfactory rust joint. Could you help me out by giving a receipt how to make a rust joint?—One in Trouble.

Replying to "One in Trouble," we beg to state there are several very good cements on the market. One in particular is called "smooth on" iron cement, which can be procured from every jobber of plumbing goods. But in case the job is urgent, we are here giving a very good formula, which is a quick-setting cement:—

24½ lbs. very fine soft cast iron borings.

¼ lb. flower of sulphur.

¼ lb. powdered sal ammoniac.

Mix with boiling water before using to about the consistency of paste.—Editor.



JOINT DOPE FOR GASOLINE TANKS.

Editor Sanitary Engineer.—I have been asked to move a gasoline pump and tank from one garage to another, and would like to know what is the best dope to use in making up the threaded joints. I know when anyone buys a tank and pump there is a small tin of dry powder and oil or something sent with the outfit, and would like to know what it is. A Fitter.

Replying to "A Fitter," we do not know for sure what the dope is made of which is supplied with such gasoline tank and pump outfits, but we do know that the best material to use is litharge and glycerine. This should be mixed in very small quantities and about the consistency of stiff paint. The writer has used it scores of times with great success. Be sure, however, to apply it on the thread of pipe, and not into the fittings.—Editor.

ENORMOUS SOOT FALLS.

Regarding the amount of soot which falls in various large manufacturing centres, we are told Pittsburgh, Penn., comes first with a fall of 1,950 tons per sq. mile per annum. Next comes Glasgow, Scotland, with 820 tons, then in the central district of Leeds and London the fall is 529 tons and 526 tons per sq. mile respectively. If an equal amount of lamp black was mixed in oil to the consistency of black paint, there would be sufficient to cover an area from 70 to 90 sq. miles with two coats of paint.



NEW CATALOGUES.

The Hawley Down Draft Furnace Co. of Easton, Pennsylvania, are issuing a very interesting book on down draft boilers. They claim their attachment is a great saver in fuel, is a smoke consumer, and increases the efficiency of any ordinary tubular boiler to the extent of 25 per cent. Those heating engineers interested in such appliances should write for this catalogue to address given, or their Canadian agents, the Engineers' Supply Co., 284 Lagauchetière W., Montreal.

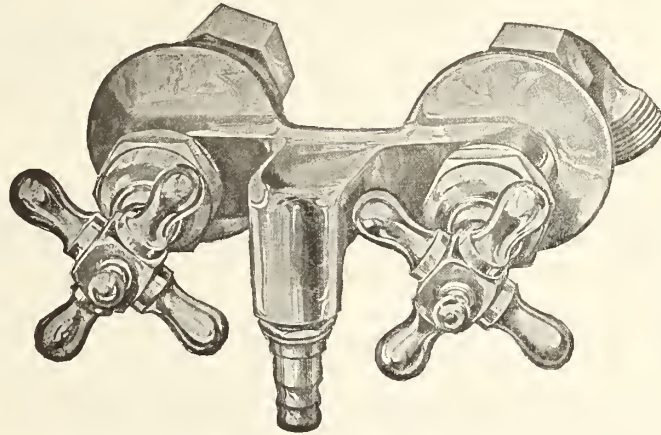


DUNHAM SPECIALTIES.

The C. A. Dunham Co., Ltd., Toronto, have just received off the press another splendid set of bulletins dealing with their various products. In compiling this latest publication new data has been added, as well as particulars referring to a new line known as the Fisher Reducing Pressure Valve and Vacuum Pump Governor. There are very novel claims being made for this new apparatus, which has been given some very rigid tests. Those of our readers who wish to add to their list of books will be able to procure one by writing to the C. A. Dunham Co., Ltd., corner of Davenport and Primrose Ave., Toronto.



EMPIRE No. 2 MIDGET BATH-COCK



Look at it well; isn't it just what you have been waiting for?
A compact and well-designed compression bath cock.

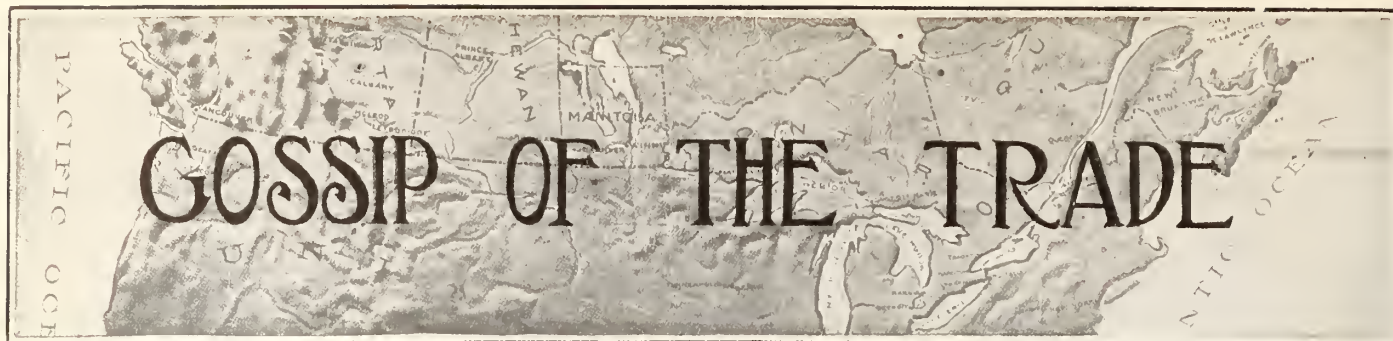
The best of metal is used in its manufacture and the utmost care taken that all threads are made to standards.

Its design has beauty in every line and the nickel finish is perfection itself.

If your jobber does not stock it write us at once, you cannot afford to be without it.

EMPIRE MANUFACTURING CO., LIMITED
LONDON, CANADA

MANUFACTURERS OF AND DEALERS IN
PLUMBERS' AND STEAMFITTERS' SUPPLIES OF ALL KINDS



NEW MANAGER APPOINTED.

It is just about four years ago that we announced the fact that Frank T. Rawley, late of the Dominion Radiator Co., had left to take up a position as Canadian manager for the Honeywell Heating Specialty Co., of Wabash, Indiana.

We one and all wished him every success in his new venture. We have now to announce that Mr. Rawley has made good, and has been appointed manager of the Montreal branch of the Dominion Radiator Co., Ltd. To see Frank T. in the manager's office the other day was a sight for sore eyes.

He has made good during his stay with the Honeywell people, which we know from actual experience, as well as having been informed by Mr. McNamee, the vice-president of the Honeywell Heating Specialty Co.

LIGHT WATER AND POWER SYSTEMS.

The Fort Wayne Engineering and Manufacturing Co., Fort Wayne, Ind., are issuing a new catalogue demonstrating the Paul systems of water-power and light, and is known as No. 2,025 dealers' catalogue. It is full of very interesting data of a general nature, and should be in the possession of every sanitary and heating engineer, and may be acquired by writing to their office, Fort Wayne, Indiana, U.S.A.

BUSINESS TRANSFER.

The Modern Plumbing & Heating Co., of Victoria, B.C., has been taken over by the Western Plumbing & Heating Co. of that city.

The Farrell Engineering Company, Limited, North Bay, has been incorporated, taking over the business formerly carried on by J. E. Farrell. At present the stockholders are chiefly practical mechanics in each line of the business. Later on the company intends to erect a plant and manufacture plumbing and heating goods.

WESTON'S NEW SEWAGE DISPOSAL PLANT.

Weston's new sewage disposal plant was inspected by a large delegation representing many towns and cities in Ontario. In the main building of the disposal plant are two tanks. One was emptied in order that the visitors might see how it is constructed. Mr. T. Aird Murray, who was the consulting engineer on the work, explained the principle of the system.

"There can be absolutely no odor," said Mr. Murray, "because the solids are trapped in an enclosed chamber, where it is impossible to give off offensive odors. When the water is turned into the river it is clear and odorless. A very slight odor sometimes overhangs the sludge bed."

After the tour of inspection the visitors were entertained to a banquet in the town hall building, corner Main street and Little avenue. Amongst those present were Mr. McQuaker, mayor of Owen Sound; Mayor Buller and Chief Engineer Parsons of Peterborough; M. Coughlin, commissioner of works of North Bay; George Syme, reeve of York Township; Charles Silverthorne, reeve of Etobicoke; Dr. E. Bull, M.O.H., for Etobicoke; Dr. Meldrum, M.O.H. for

Weston, and Mr. Hilma, ex-mayor of Oakville.

"I am disappointed that the members of the Toronto City Council are not present," said Mr. Murray. "Some promised to attend. We expect them to visit us shortly. The trouble with the Morley avenue sewer is that it has no bairns. Here we imprison the sludge; at Morley avenue it lies in the bottom of tanks and gases escape. As yet only about one-third of the lateral sewers are in, and should the medical officer of health desire it, a chlorination plant could be installed at a small cost, to further treat the sewage before it is returned to the river."

A COMMUNICATION.

We are informed by the Standard Ideal Co., Ltd., Port Hope, Ontario, that Mr. J. J. Laferme, who has for some time past represented them in Montreal and vicinity, is no longer in their employ, and that until his successor is appointed their Montreal office will be in charge of Mr. Walter Lyons.

CITY VISITORS.

The following gentlemen paid a visit to the office of Sanitary Engineer last week:—W. Brittan, of Hamilton, and R. G. Sturgeon, of Peterborough. Several interesting subjects were discussed, and the chances are the discussions would have still been in progress had it not been for the fact that this issue comes out on the 15th as well as the 1st of each month. It's good to meet the boys anyway, "So let them all come," says Sanitary Engineer.

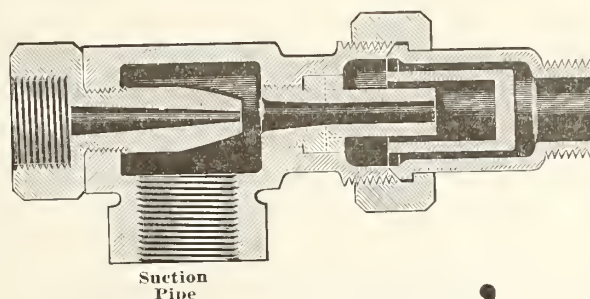
DON'T FORGET

The next Annual Convention of the Canadian Society of Domestic Sanitary and Heating Engineers will be held in Ottawa, June 9, 10, 11.

Save one

The Morrison Water Jet Lifter is a money-saver you can not afford to be without. Full particulars sent on request.

City
Water
Supply



The Ultimate Pump

The Morrison Water Jet Lifter is the simplest, cheapest and yet practical and reliable pump ever offered to the plumbing trade. It is used for draining flooded cellars, excavations, or any accumulation of water.

It is self-priming, and requires no labor to operate it. Pumps hot or cold, clear or muddy water, to any lift up to thirty feet.

It is absolutely fool-proof, works anywhere in any position. All that is necessary is a city water service to supply it.

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**James Morrison
Brass Mfg. Co., Ltd.**

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Babbitt Metal, Bar Solder, Wire Solder, Lead Pipe, Bar Lead, Traps, Bends, Copper, Tin and Antimony.

Let the goods prove their worthiness of a place in your stock. Send a trial order.

Hoyt Metal Co.,

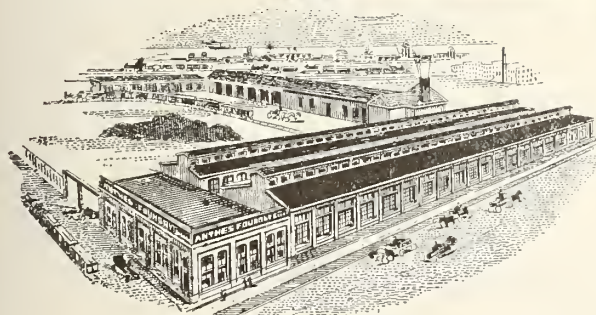
Toronto, Ont.

New York, N. Y.; London, Eng.; St. Louis, Mo.

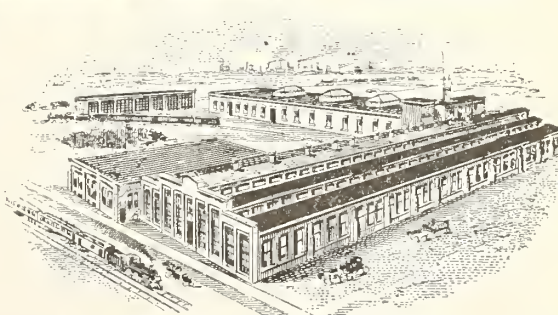
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SOIL PIPE
AND
FITTINGS**



"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

A PLEA FOR INDUSTRIAL EFFICIENCY.

(Continued from page 29.)

with your request, write stating your case to Dr. F. W. Merchant, Supervisor of Industrial Training and Technical Education, Parliament Buildings, Toronto. He will, I feel confident, give the matter immediate attention and compel your local board to take action.

When Dr. Merchant inspected the London School during the winter term, he expressed surprise that other cities had not provided for plumbing, and I am sure that he will do his utmost to further your interests and give excellent assistance as he is not only a paid official, but a man who has an abundance of enthusiasm for trade training, and has a complete grasp of its requirements.

Again: the thought of who will give the instruction in your particular town may possibly be a reason to make each member of the trade just a little timid for fear that he may be selected as the instructor. A man may be an excellent tradesman, yet to teach that trade in a course is quite another thing. But have no fear; if you are selected, take it on and do your best. Dr. Merchant wants the classes presided over by practical men only, as far as possible; his object being to have instruction carried on in the identical manner as practised in the shop, thereby training the students true to life. Academic training has no place in an industrial school.

The position of an instructor is a very interesting one, and I can assure you, from my own experience, that if you once start it you will find a satisfaction far greater and of vaster value than your salary. It makes a man feel that he is doing something for his fellowmen. "I expect to pass through this life but once, if there is any kindness or any good thing I can do to my fellow-beings, let me do it now. I shall pass this way but once."

The London Society of Domestic Sanitary and Heating Engineers did a good thing for the trade when they asked the Department for facilities to carry on a class, and the members are still backing up the stand they took, by giving the boy who is in the class waiting for an opening, a position in preference to the boy off the street. In this way they are getting beginners of a higher standard, and their apprentices are making rapid progress also.

The accompanying photo is merely a progress report of the work taken up by the students during the past winter.

I am pleased to know that Toronto is preparing to establish a class, the success of the undertaking is assured, I feel confident, because in a large city like Toronto there should be no trouble

whatever in getting plenty of students, and I have the pleasure of knowing personally many of her sanitary engineers who would make able instructors.

What are you doing in your city? This is the question I am leaving with my fellow craftsmen.



MAKES CHANGE OF BUSINESS CONNECTION.

Mr. J. J. Laferme, well known to many of our readers in connection with the sales of one of the Canadian manufacturers of enameled iron sanitary ware, has severed his connections with said firms, to devote his time and energies to the sales of a prominent British manufacturing firm of porcelain sanitary fixtures. His present offices are situated temporarily at 68 Beaver Hall Hill, tele-



J. J. LAFERME, Montreal.

phone Uptown 6730, pending his return from England, to which country he sailed on the s.s. Megantic May 9th, to arrange with the manufacturer in question the details of the business.

Mr. Laferme was handling his new line all of last year, and the success met with, both as to sales and the satisfaction the goods gave his customers, decided him in making it the leader among his agencies.

Mr. Laferme, before being associated with the sanitary business, was an architect, having studied the profession in Paris. At the Exposition of 1900 in Paris he was architect to the United States Government and assisted in laying out the decoration of the United States sections. His designs and their execution were treated as a decorative

exhibit by the French Government, who awarded him a first prize medal and the decoration of Officier d'Academie. After the Exposition he remained in Europe on behalf of American sanitary goods and was one of those who created throughout Europe a demand for up-to-date sanitation, in which the continental countries were very deficient.

Among the prominent European buildings in which he was successful in introducing American sanitation are the Hotel Meurice, Grand Hotel, Paris; Hotel Continental, Munich; Midland Hotel, Manchester; Hotel de l'Hermitage, Royal Hotel, Nice; De Keyser's Hotel, Westminster Hotel, Royal Palace Hotel, London, etc., etc.

The firms Mr. Laferme represents are: Johnson Brothers (Hanley), Ltd., Stoke-on-Trent, England; Gibbs & Canning, Tamworth, England; the Central Brass Manufacturing Co., Cleveland, U.S.A.; the Trent Tile Co., Trenton, New Jersey; the B.O.T. Co., Toronto.



A THEORETICAL EXPERT IN SANITARY SCIENCE.

In a thriving town in Nebraska a certain teacher in the high school is supposed to be well enough informed in sanitary science to teach it and to have supervision of the plumbing in the school building. Recently this professor built himself a house. He was not satisfied with the price asked by a reputable plumber for doing a first-class piece of work in the new home, so he bought tile sewer pipe from a mail order house and hired a "plumber" to put it in with cemented joints, not only for the drain in the basement, but for the soil stack as well. It would be difficult for us to say just what we think of such a man, or such a job, or such a "plumber." We so often find language inadequate fully to express our feelings or our opinions. We believe we are putting the matter with almost reprehensible mildness when we say that the "professor" by his practice shows that he is unfit to teach, to have a home, or to be charged with the responsibility of a family; and that the "plumber" who would do such a job should not be allowed to operate on anything more important than drain tiling on a farm. It is assumed from the incident that the town in question has no plumbing inspection; but there seems to be some hope for it, for the leading and reputable plumbers of the place are working for the adoption of the necessary ordinance and regulations. Returning briefly to the professor: We wonder how much heart and soul he is able to put into the teaching of sanitary science with his mind reverting occasionally—as it must—to that many-jointed tile soil-stack?—Valve World.



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Efficiency in Business a Matter of Health?

Do you believe in the nationalization of Medicine, so that each person has regular medical attendance?

The proposition is made by a well-known medical practitioner in the June MacLean's Magazine, to nationalize Medicine in Canada. In this article he proposes to have a state system whereby every man, woman and child will have regular medical inspection at a nominal fee. The human body will be thus under the supervision of experts and all defects detected at once, and many later troubles avoided by the regulative and curative processes employed at the time.

The whole suggestion is of such importance that it will be of interest to every person in Canada, and Canadians generally will applaud the enterprise that produces so strong a magazine as MacLean's.

The illustrations are made especially for MacLean's. Each article in the issue has been the selection of a competent staff of editors. Besides this one on the physical side of life there will appear a second efficiency article by Mr. Shepard, of the Emerson School on Efficiency in Business, which is a top-notch. It means much to every business manager.

Other articles equally entertaining and thoroughly novel are treated by leading writers. The short story features, the special art features, and the Review departments are unusually good. The cover design is another of Coburn's, who has made such a hit with Canadian admirers.

Here are some of the other articles that appear in this issue:

A Week-end Visit to Rideau Hall.
Bungalows—of Many Types.
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Donald Brian—Canadian Actor.
Carson—As He Is.
Swiss Guides in the Rockies.
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WRITE DEPARTMENT M.

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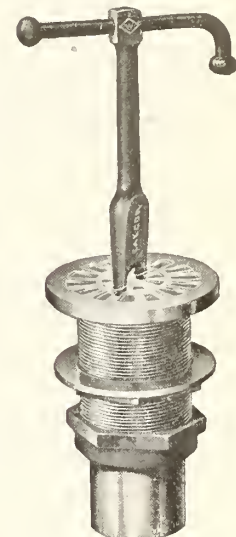
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Universal for Pipe and Fittings

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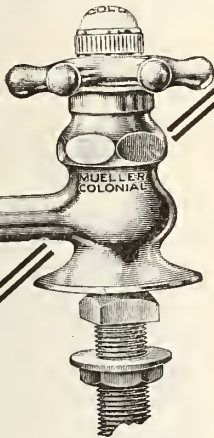
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The Smooth
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Lends Life to
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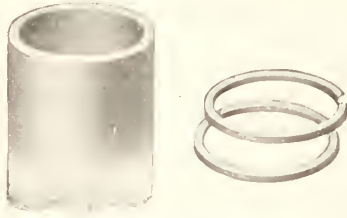
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Send me catalogue
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Beaver Square-end Pipe Cutter

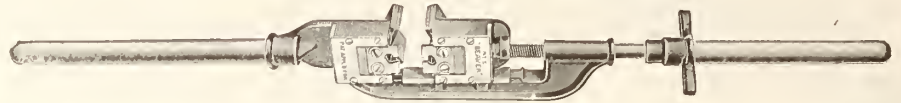


Cut With "Beaver" Square
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Done With Ordinary
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One set of knives—no changing



cuts the pipe off clean and square,
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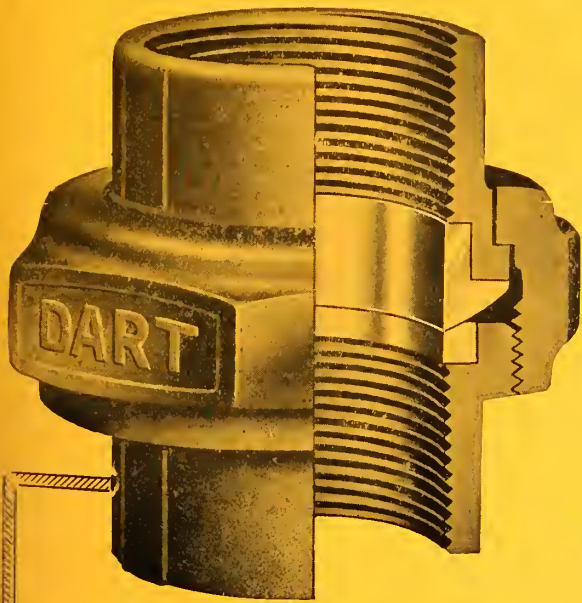
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FIG. 141

Standard Pattern,
Iron Body Globe Valve,
Screwed with Yoke



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It cannot Rust
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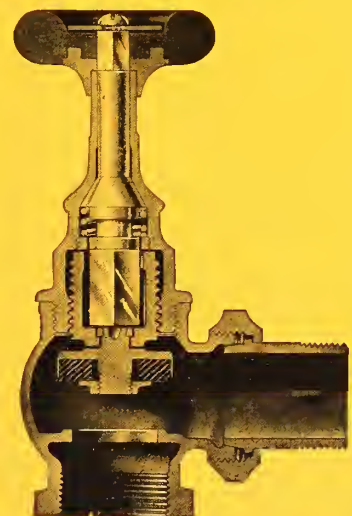
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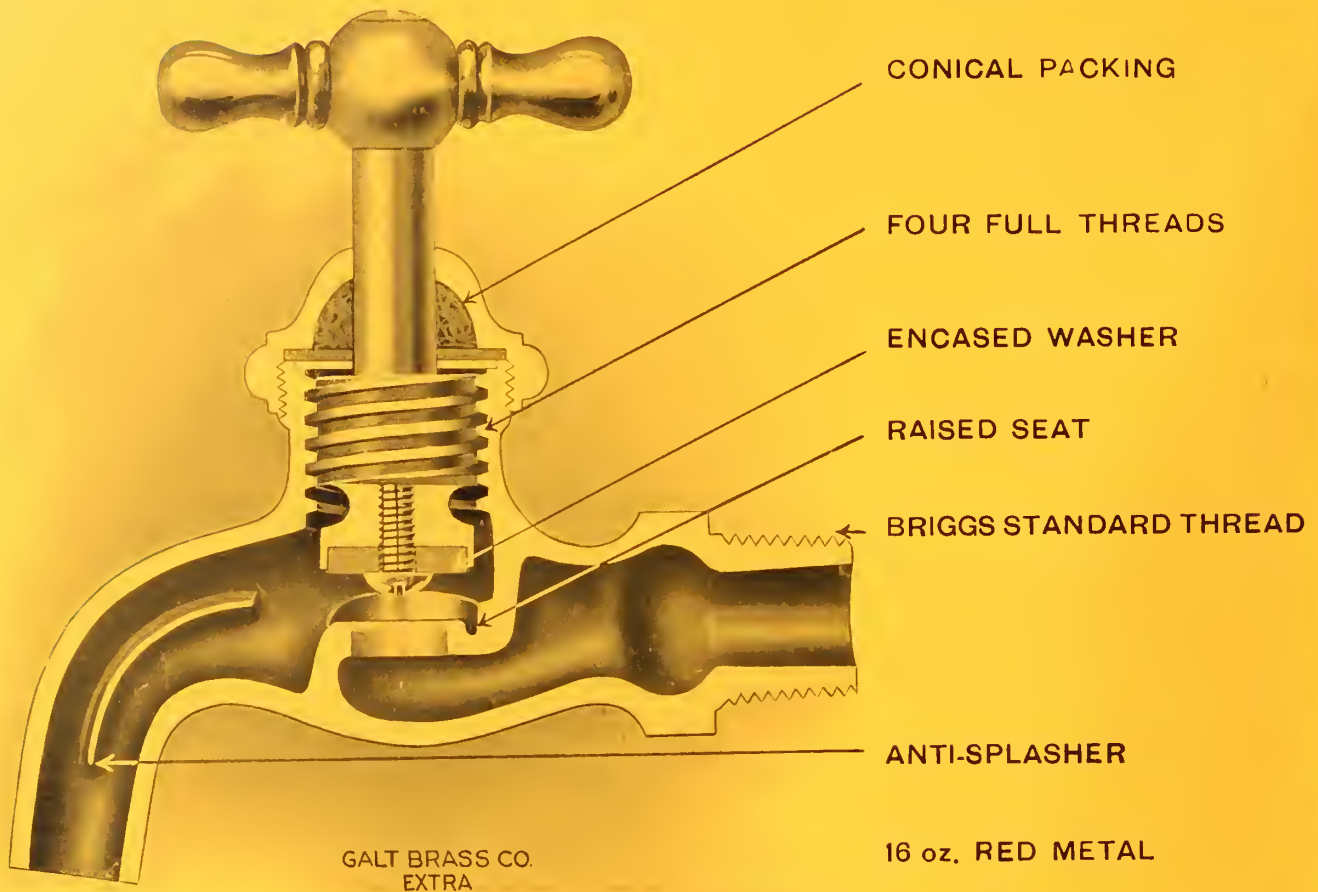
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THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

Publication Office : TORONTO, JUNE 1, 1914

No. 11

ENAMELED
ALL OVER

Victor BATH
ONE-PIECE

ENAMELED
INSIDE



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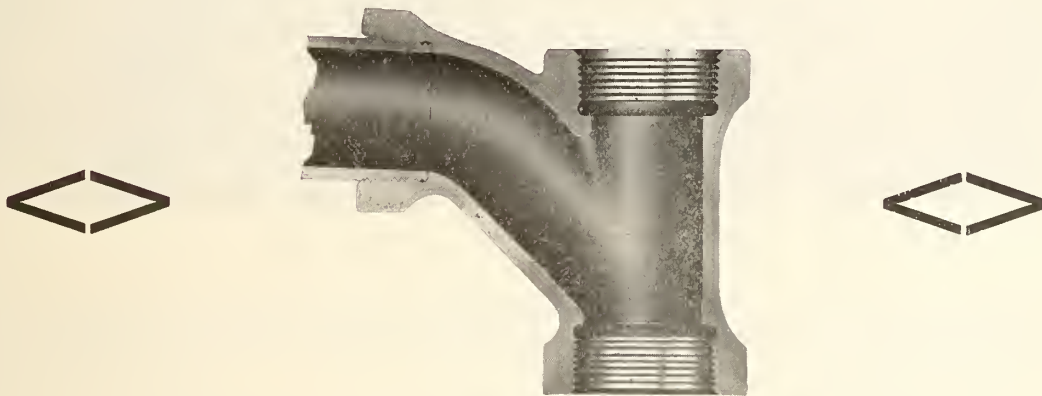
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**We are now Manufacturing
a complete line**



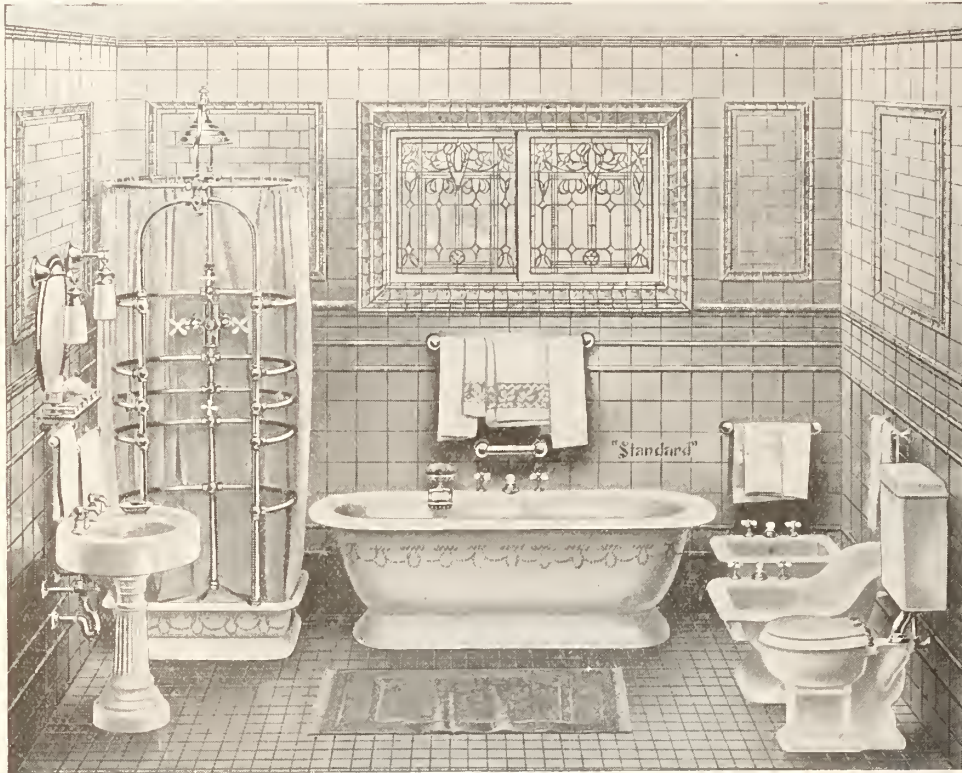
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“Standard Sanitary” Plumbing Fixtures



“Standard Sanitary” Bathroom of Queen Victoria of Spain.

The above cut was made from a photograph of the fixtures actually installed in the Royal Palace of La Magdalena, Santander, Spain, the summer residence of their Majesties, the King and Queen of Spain.

A similar bathroom was also installed for the King, and eighteen other complete “Standard Sanitary” Bathrooms for the other members of the household.

This is an extremely practical and beautiful interior and combines with beauty and refinement every modern sanitary idea.

The fixtures are set into the tiling, thus offering no place for dust or moisture to collect, and reducing cleaning labor to a minimum.

The Foot, Sitz and Shower Baths make an unusually complete and artistic bathroom at a cost that is very reasonable, considering the quality of fixtures shown.

“Standard Sanitary” plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales-agents throughout the Dominion.

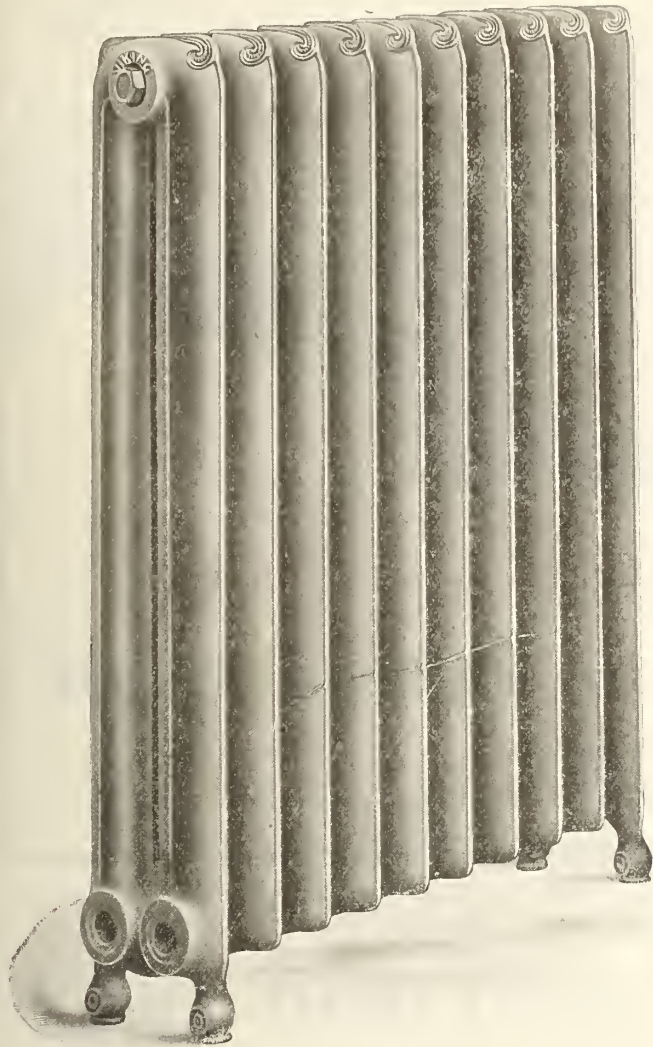
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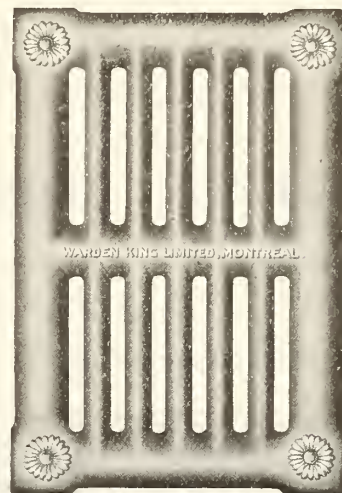
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The New
**“VIKING”
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We are the sole manufacturers of the celebrated “Daisy” Hot Water Boiler. Over 55,000 in use; this speaks for itself. Repair parts, if necessary, for any of the different styles, may be obtained without delay.

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Mr. Plumber,--

DO YOU GET FULL VALUE FOR YOUR MONEY?

Buy "M. R. M." Pipe and save time, by doing better and quicker work, which means increased profits and satisfied customers.

It is always found true, uniform and reliable—each length as perfect as the last. Every length of "M. R. M." Pipe is tested to 600 lbs. per square inch.

Practical plumbers prefer to use it because it is labor saving and easy on the dies.

Always specify for "M. R. M." Brand Pipe.

THE STEEL COMPANY OF CANADA, Limited

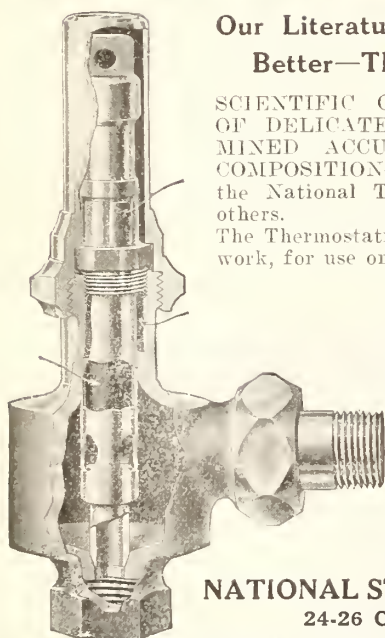
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National Valves. Scientifically } Correct Economically } Usefully }



**Our Literature Tells Why They're
Better—Their Use Proves It.**

SCIENTIFIC CONSTRUCTION—ABSENCE OF DELICATE PARTS — PRE-DETERMINED ACCURACY — BRASS-ENCASED COMPOSITION—all of these are features of the National Thermostatic Trap—there are others.

The Thermostatic Valve is adapted to various work, for use on Vacuum Systems, Dry Kilns, etc., etc., and is guaranteed for 5 years.

If you want Perfect Service, based on perfect valve principles, the National Thermostatic Valve will answer this purpose.

Write for our literature on the complete National Line, such as the B Heat Intensifier, B Pipe Joint Compound, "Perfection" Radiator Fitting, etc., etc.

NATIONAL STEAM SPECIALTY CO.

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L. N. Vanstone, 8 Wellington St. East, Toronto
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300,000 lbs.

carried in stock for immediate
shipment of

Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

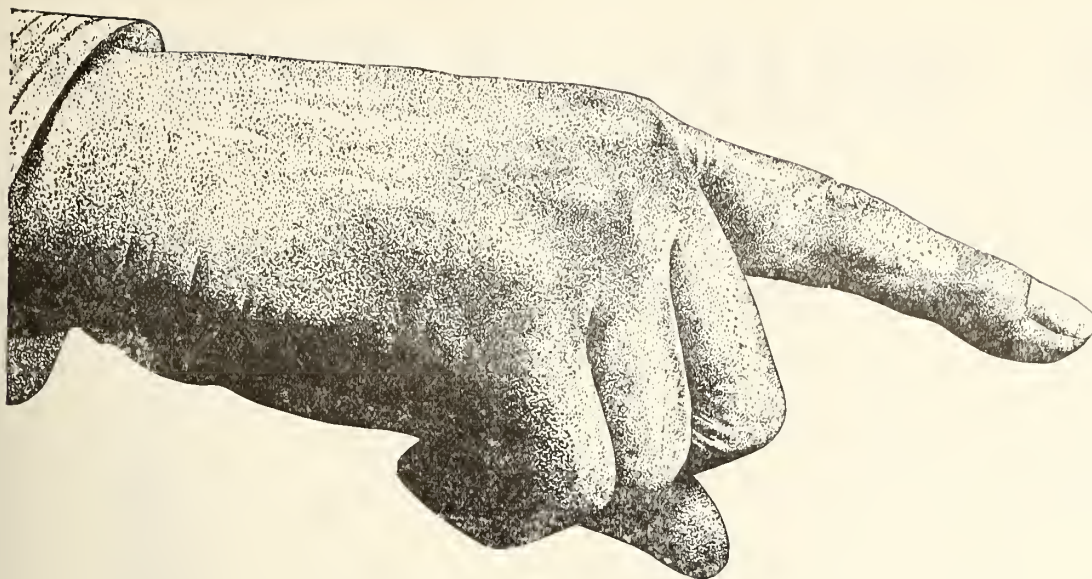
Brass and Copper Rod.

Brass and Copper Sheet.

WRITE US FOR PRICES

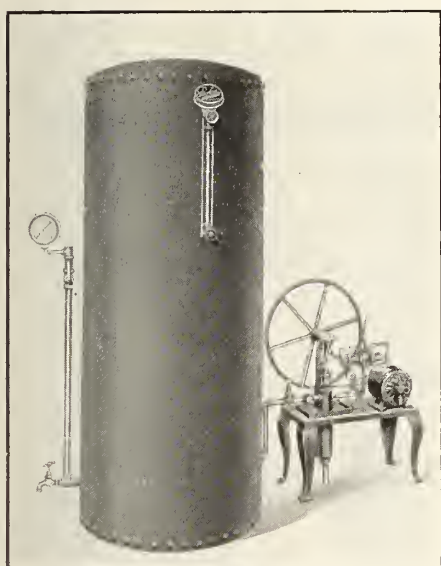
Tallman Brass & Metal Co.
HAMILTON, ONT.

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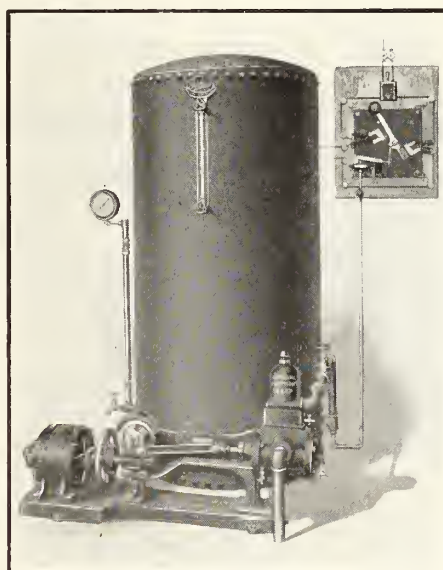


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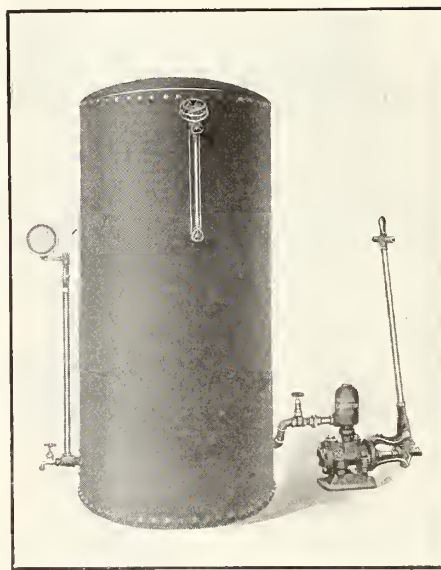
Means made in Canada: a guarantee by a successful Canadian Firm: a Firm that specializes in one kind of business and are recognized as "THE BIG PEOPLE" in that line.



300 SERIES—AUTOMATIC ELECTRIC
125 Gallons per Hour.



400 SERIES—AUTOMATIC ELECTRIC
400 Gallons per Hour



112 SERIES—HAND POWER

National Equipment Company, Limited
Wabash Ave. Toronto, Ont.

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THE WORLD OVER

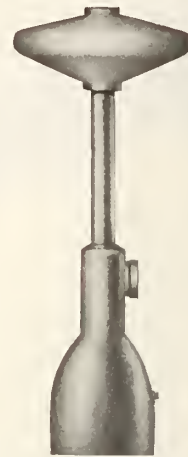
The Honeywell Heat Generator is the recognized standard seal for hot water heating systems.

MORE THAN 167,000 IN USE

The Honeywell Method of Hot Water Heating is to be found in every civilized country in the world where artificial heat is required, and when it is considered that the phenomenal growth of the Honeywell System covers a period of only eight years, the merits of the system must be recognized.

Send us your plans and let us design a system for you. It can be installed cheaper and will work much better than old style hot water.

Handled by the leading dealers in heating supplies.



HONEYWELL
HEAT GENERATOR

HONEYWELL HEATING SPECIALTY COMPANY

NEW YORK OFFICE:
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WABASH, INDIANA
BIRMINGHAM, ENGLAND

MONTREAL OFFICE:
1008 Eastern Townships Bank Building

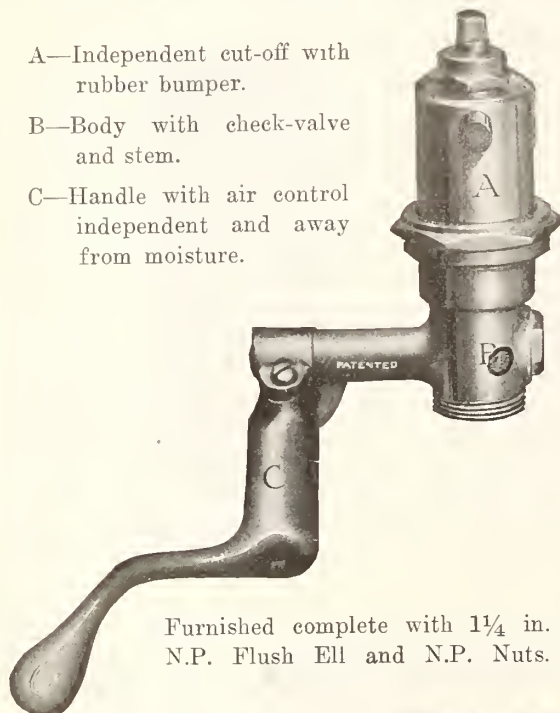


Wolverine Flushometer

PATENTED

Durable - Inexpensive - Economical - Simple

- A—Independent cut-off with rubber bumper.
- B—Body with check-valve and stem.
- C—Handle with air control independent and away from moisture.



Furnished complete with 1 1/4 in.
N.P. Flush Ell and N.P. Nuts.

The only Direct valve on the market. No small by-passes to stop up or corrode and each valve is furnished with independent cut-off with rubber seat bumper.

Flush can be adjusted without shutting off the water.

For Direct pressure or gravity systems. Write us for price and further information.

Manufactured and guaranteed by

Canadian Wolverine Co.
LIMITED

Chatham, Ont.



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There is an old dog-eared Latin quotation that means, in plain English, "Let the Buyer Beware."

I wouldn't be surprised if the contractor for the Coliseum had it carved on a brick and hung in his office where he would have a "Do it Now" sign hanging to-day if he had lived.

"Let the Buyer Beware" is the wrong idea. That's punk business philosophy. It's "Let the Seller Beware" these days. You can't build any kind of a business unless you sell good stuff, give the best service, and hustle.

As Sir Thomas Lipton says in his ads., "Honest 'T' is the Best Policy."

Since the establishment of the House of Gurney in 1843 we have been going

after the trade of the plumbers and steamfitters of Canada, offering them quality and service.

Every year we have tried to supply you better goods, newer and more efficient designs, prompt deliveries.

We prosper as you prosper. We can't afford to have you lose a single sale because Gurney goods have fallen down. So it's not the Buyer that must beware, but the Seller, and that means first us and then you.

We have never found, during all our years in business, an easier way to make a business grow than to get a reputation for quality, and take it from me, you never will, either.

Sam Oven, with the Gurney's.



The Gurney Foundry Co.

Established 1843

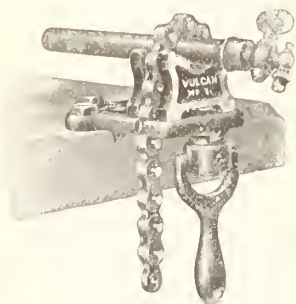
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TORONTO

CANADA

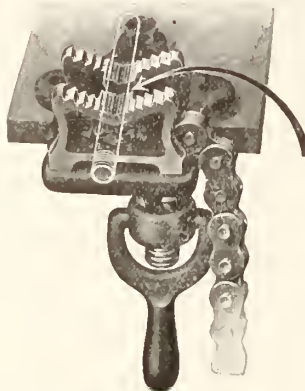


Williams Unusual "VULCAN"!



BECAUSE "VULCAN" Vises are unbreakable in service.

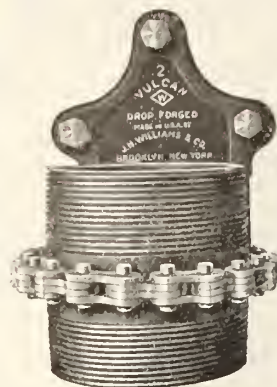
BECAUSE no other vise will hold irregular shapes as well. Either fittings or Pipe are "meat" for the "VULCAN."



BECAUSE if you wish to bend pipe, no other Vise will help as much. Use an eye-bolt in one of bolt holes for "staying" the pipe.

BECAUSE if you don't want to bend the pipe no other tool will prevent it in a better way — see the extended teeth on jaws (No. 1 size) and the "wrapping" contact of chain.

3 sizes, capacities 1/8 to 8" pipe.



Send for Dependable Chain Tools Pamphlet or consult your dealer.

J. H. Williams & Co., Superior Drop-Forgings 77 Richards Street, Brooklyn, N.Y. City.

John Wanamaker says that advertising doesn't jerk — it PULLS. He ought to know, and yet some men think that advertising should go against all rules and precedents and jerk them to success with one tremendous yank.

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal

Works: Lachine Canal

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No More Water Loss From Leaky Faucets

Water experts prove that leaky faucets waste millions of dollars worth of water every year throughout the United States.

In 1911—in the City of New York alone—a campaign against leaky fixtures actually saved \$20,705,000.00 at meter rates.

Statistics show that every dripping faucet wastes from \$2.00 to \$6.00 worth of water annually.

This loss can positively be prevented for all time by the installation of the

J-M Washerless Faucet

Leakage is absolutely impossible with this faucet. Instead of the usual washer, which quickly wears out, the J-M Washerless Faucet is made with a conical valve or "jumper" that bears directly on a spherical seating. The metal-to-metal line contact between valve and seating is perfect at all times.

Seating is guaranteed for ten years against ordinary wear. Operates equally well on high or low pressure, and on hot or cold lines.

Not an experiment. Thousands in successful use for years. Authorized by the Metropolitan Water Board of London.

Write our nearest Branch for Booklet.

THE CANADIAN H. W. JOHNS-MANVILLE CO., Limited

Manufacturers of Plumbing Fixtures; Closet Seats; Flush Valves; Copper Floats; Pipe



Coverings: Pipe Joint Cement; Joint Runners; Packings; Etc.

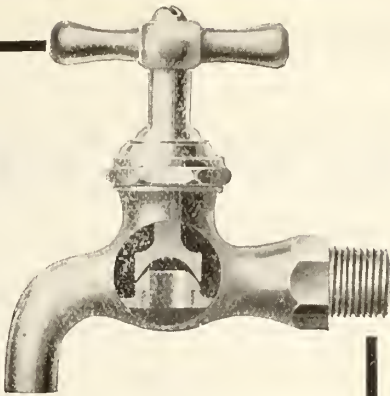
TORONTO

MONTREAL

COVERS THE CONTINENT

WINNIPEG

VANCOUVER





PERFECTION FLOOR AND CEILING PLATES

300,000 always on stock.
Sizes from $\frac{3}{8}$ to 4 in.

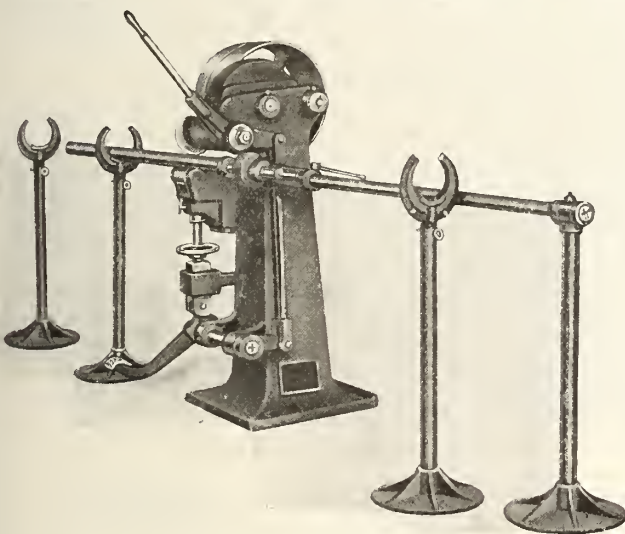
The most popular plate is our No. 10 Hinged Press'd Steel or Brass. We manufacture all lines shown on cut.

The BEATON & CADWELL MANUFACTURING CO.
New Britain, Conn.

Eastern Agent: J. R. Devereux, 142 St. Joseph Boulevard West, Montreal.
Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.





The Hall No. 2 Rapid Upright Roller Pipe Cutter for Rapid Work and a Clean Cut

By repeated tests this machine has proven the most efficient and economical pipe cutting device on the market, and is used for this purpose by all of the tube mills in Canada and most of the leading plumbing and steam-fitting houses.

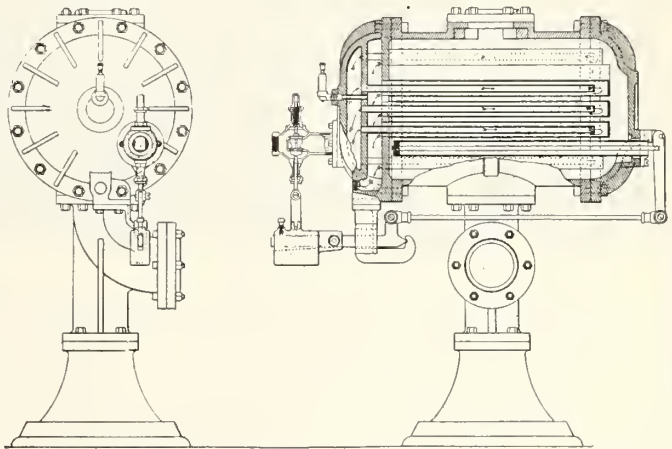
Regular capacity $\frac{1}{2}$ to 2-in., with extra cage will take $\frac{1}{8}$ to $\frac{3}{8}$ -in. pipe.

Write us for catalog and prices on pipe threading lathes, any capacity from $\frac{1}{4}$ to 18-in., also single and double head rapid nipple machines. No delays, delivery from stock.

JOHN H. HALL & SONS, Limited
BRANTFORD, CANADA

The "Manny" Heater

Affords Every Aggressive Steamfitter An Excellent Opportunity to Make Large Profits



The Manny Heater is connected to a hot water system as the ordinary hot water furnace, and steam is carried to it from a boiler house stationed outside the main building, at regular boiler pressure, but reduced at every heater by a steam pressure reducing valve to 20-15-10-5 lbs., or as low as one pound to the square inch, according to temperature required in the building. The steam is carried to the Manny Heater from the boiler room through underground pipes.

There isn't a better or more economical way of heating large buildings. Many furnaces can be eliminated and much space saved. Supplied with or without Thermostats. Notice how provision is made for the expansion and contraction of tubes—Threaded Joints.

Let us give you full particulars, regarding this newest and best method of heating. Write for descriptive catalog F.

The E. S. Manny Co., Montreal

SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, JUNE 1, 1914

No. 11

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On comparing the service of an 8-year-old Vitro tank with any other make installed under similar conditions, one always finds the VITRO practically as good as new and the other with signs of the wear and tear.

Vitro tanks are made of a material called Resinate Calcium, which will hold water indefinitely without a lining and without rusting, decaying or soaking up.



Over
160,000
now on the
market

Watch These Figures Grow

The Ball Cock, Flush Valve and Lever are all made from the best quality ingot metal. These parts work smoothly and noiselessly and will give hard service for years without repair.

Drop a card for catalog.

Cluff Manufacturing Co., Limited

Office and Factory:

65-75 Sterling Road, Toronto, Ontario

SOLD BY ALL JOBBERS

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STEEL AND RADIATION, LIMITED

"KING" BOILERS



No. 6. High Base "KING" Boiler, Showing Double Shaker.

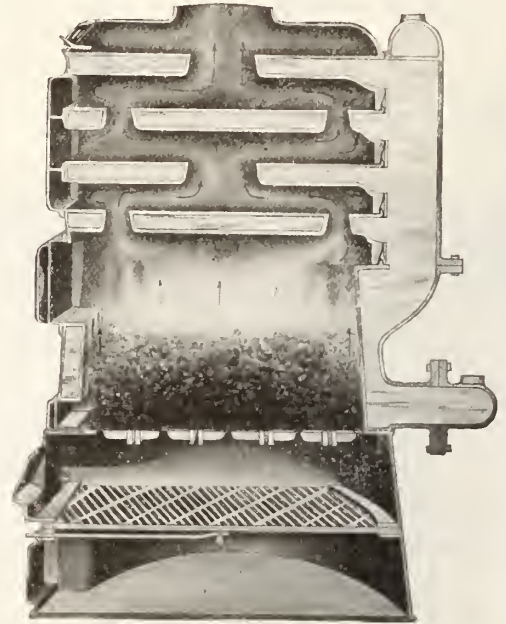
A Hot Water Boiler That Is Standing The Test.

"KING" Boilers carry our unqualified guarantee.

Mr. Heating Engineer,—

Isn't it worth something to deal with a house that has faith in its product and will stand behind the goods they manufacture?

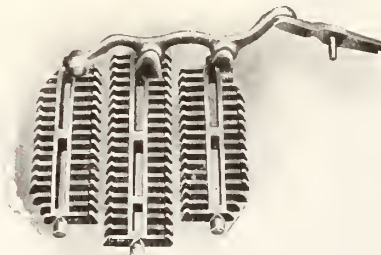
The talking points on a "KING" Boiler are numerous, in fact too numerous for us to attempt to explain them in this limited space. A few of them need no explanation and are shown in the accompanying cuts.



Sectional View of "KING" Boiler, Showing Improved Design of Waterways, Combustion Chamber and Fire Travel.

"SPECIAL FEATURES"

The large one-piece ashpit.
The special shaking grates and convenient shaking arrangement.
The fire-pot with a real corrugation.
The well-arranged and properly proportioned combustion spaces.
The easily-cleaned flues.
The double shaker.



Grate Bars and Connecting Bar, Showing Method of Connection Without Bolts or Pins.

The perfect fit doors.
The thin and rapid circulating waterways.
The extended and scientifically arranged heating surfaces.
The absence of defective sections on account of the use of iron patterns.
The ease of erection.

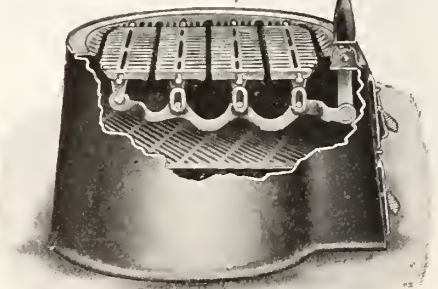


"KING" Fire-Pot, Showing Wide Corrugation, Adding One-third to Heating Capacity.

Investigate for Yourself.

Did you get one of our new catalogues or hand books? They are complete and contain valuable information. Drop us a card and we will mail it.

Try us for your Valves, Pipe and Fittings, as well as Boilers and Radiators. Right prices and prompt delivery.



"KING" One-piece Ashpit, Showing Patented Improved Trouble-proof Grates and Shaking Mechanism, Free from Bolts or Pins.

STEEL AND RADIATION, LIMITED

HEAD OFFICE: FRASER AVE., TORONTO

Showrooms: 80 Adelaide St. E., Toronto

304 UNIVERSITY ST., MONTREAL

101 ST. JOHN ST., QUEBEC

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THE SANITARY ENGINEER

VOL. VIII.

JUNE 1, 1914.

No. 11



The heart of Canada's capital, showing Parliament Buildings in the distance to the left, Chateau Laurier to the right, G. T. R. station, G. P. O., and new Russell Hotel.

Annual Convention Held in Canada's Capital

Some of the Most Interesting Sightings Which May be Seen by Sanitary and Heating Engineers When Attending the Annual Convention—An Interesting Review of the Early Days of the Capital.

WHILE sanitary and heating engineers are attending the annual convention, which is to be held in the city of Ottawa on the 9th, 10th and 11th of this month, they will no doubt make a point to see a few of the most interesting sights. Ottawa, no doubt, is a beautiful city, and as capital of this fair Dominion is looked upon as a city of no mean order.

In the year 1894, just twenty years ago, Professor John L. Stoddard, the distinguished lecturer and traveler, spoke of Ottawa in the following terms:

In the year 1858 Queen Victoria selected Ottawa as the seat of the Canadian Government, and it is consequently the capital of the Dominion of Canada. It is a city of only about 40,000 inhabitants, but

its Government buildings would do honor to any capital in the world. They form three sides of a quadrangle, and are situated on an eminence 150 feet above the Ottawa River, covering an area of nearly four acres, their cost amounting to over four million dollars. They are substantial and yet extremely ornamental in appearance. The general style of their architecture is Italian Gothic. The arches of the doors are of red sandstone, and the columns and arches of the legislative chambers are of marble. The roofs are rendered attractive by means of variously colored slates, and the towers and pinnacles are adorned with iron trellis work. The interior decorations of this edifice are also

very rich and tasteful, including the Viceregal canopy and throne, a beautiful marble statue and portrait of Queen Victoria, and full length likenesses of George III. and Queen Charlotte, by Sir Joshua Reynolds. The library of the Government is a very handsome and valuable portion of the structure, and contains more than 100,000 volumes. Ottawa has, in addition to these fine Houses of Parliament, a fine Cathedral, with lofty spires, and an imposing Catholic institution known as the Grey Nunnery. At one extremity of the city are the famous Chaudiere Falls, in which the Ottawa River plunges over a rough precipice forty feet high and over 200 feet wide. The "Chaudiere" itself or caul-

dron, is of unknown depth. The sounding line has not found the bottom even with a length of 300 feet.

It may be added that down the Ottawa River, which is the chief tributary of the St. Lawrence, a steamboat makes a daily trip to Montreal (101 miles away) in about 10 hours—a pleasant relief from railroad travel.

In this article Sanitary Engineer is going to take the reader for a trip through the city of Ottawa, pointing out some of the very interesting places which may be visited and giving instructions as to how these places may be reached.

In one of the panels accompanying this article is given a list of places, with

names of the various car lines to be used.

The C.P.R. and Grand Trunk Railways have a union station which, for beauty of architecture and situation ranks very high. The traveler on arriving at the depot is at once in the heart of the capital. Below is the dark water of the Rideau Canal, recalling the early days of Bytown, when the name Ottawa had not come into use. The canal connects with the River Ottawa by a series of precipitous locks, kept in perfect trim, but not much used.

Across the road is the renowned Chateau Laurier, one of the largest and most up-to-date of Grand Trunk hotels. But the eye long ago will have seen the towers of the Parliament Buildings,

which stand on a promontory, and help to give to Ottawa its beauty and distinction.

Turning another angle in the circle, one faces the post office, not a very imposing building for the Capital, but having a unique situation at the head of Connaught Place, a plaza, which spans the Rideau Canal, and on which you stand as you leave Central Station. Looking ahead, straight over the locks, northwards, your eye catches a glimpse of the Alexandra Bridge, which connects the Capital with Hull, Que. The Laurentian mountains are in the distance. Look around. To the east lies the older part of the city. Look up the canal, and you will get a glimpse of residential new Ottawa. By proceeding to the left, you will come to Sparks Street, the commercial street of Ottawa.

This is the experience of those from the east and the west, who arrive at Central Station.

Among the interesting places to visit are the Victoria Museum and Rideau Hall. The latter place can be reached by taking a Rockcliffe street car on Sparks Street, going east. It passes along Sussex Street, where the new Government departmental buildings are being erected. This is one of the most interesting streets in the city. It is an old commercial thoroughfare. Near the English church at the beginning is the office of "Le Temps," the only French daily newspaper. On the right one gets a passing glimpse of Byward market, attended by farmers from miles around.

At a considerable distance along Sussex street the visitor will be struck by the jail-like appearance of a smart-looking building, the doors of which are guarded by soldiers. This is the Royal Mint, in which our coins are made. Canadian bills are manufactured by two private concerns, whose plants are situated near the Parliament Buildings. Near the Mint is the Archives building.

A remarkable view then opens up to the eye. The car runs on the very edge of a cliff, overlooking the river, and east and west the view is one that will not easily be forgotten. From here the grade is downward. At the foot, near some large lumber mills, are Rideau Falls, where the Rideau River empties itself into the Ottawa from a height of about 50 feet.

On the right will be seen what appears to be a cosy country village, but which is one of Ottawa's chief suburbs, known as New Edinburgh. The lumber mills mentioned are known as the W. C. Edwards Co., Ltd. There most of the inhabitants of New Edinburgh are employed.

The next view of note are the massive entrance gates leading to Rideau Hall.



Beauty spots on the Government Driveway.

the official residence of the Governor-General, where if the readers wish to alight they may do so and visit this place. If, however, they wish to continue the car ride they will be able to travel through the heart of Rockcliffe Park and still further for several miles, until the famous rifle ranges are reached. Returning by the same route, until a little past the entrance of Rideau Hall, the visitor may procure a transfer at Alexander Street, taking a St. Patrick car. Traveling along Creighton Street, which is the main street of New Edinburgh, at the extreme end will be seen the village of Clarkstown.

Turning to the right, the car travels over the Rideau River again, over what is known as St. Patrick Street Bridge. Then traveling along St. Patrick Street the visitor will see the old section of what was known as Bytown. This section is inhabited chiefly by the French-Canadian population, as will be seen by the various business signs over the different establishments. If the visitor wishes to continue his ride, he will be taken along Dalhousie Street, then on to Rideau Street, passing McKinley & Northwood's, Ltd., 56 Rideau Street (Mr. McKinley is president of the association), and on past the Chateau Laurier and new G.T.R. station, then along Sparks and Wellington Streets, until the Ottawa River is reached, passing over at the famous Chaudiere Falls to the city of Hull, Quebec.

City of Hull.

No visit to the Capital should be terminated before seeing the city of Hull, that busy spot across the river. Hull is probably more a French city than Quebec itself. Notice the enormous amount of lumber stacked around. It is a sight seen nowhere else in the world. The gigantic Chaudiere Falls supplies all the power to the immense paper mills of J. R. Booth, the "lumber king," and those of the E. B. Eddy Co. If the visitor is curious as to what the inhabitants think of their lumber yards, he will be told that they are the largest in the world, which is, by the way, an actual fact. Note the many religious buildings, distinguished by their whiteness, contrasted with the dark framework of the dwelling houses.

The visitor may either take one of the Hull Electric Railway cars, or walk through the city. It is best to return by one of the Hull cars, from which a splendid view of the Houses of Parliament can be obtained while crossing the Alexandra Bridge. The ride is one of the most interesting in the district.

Other Places of Interest.

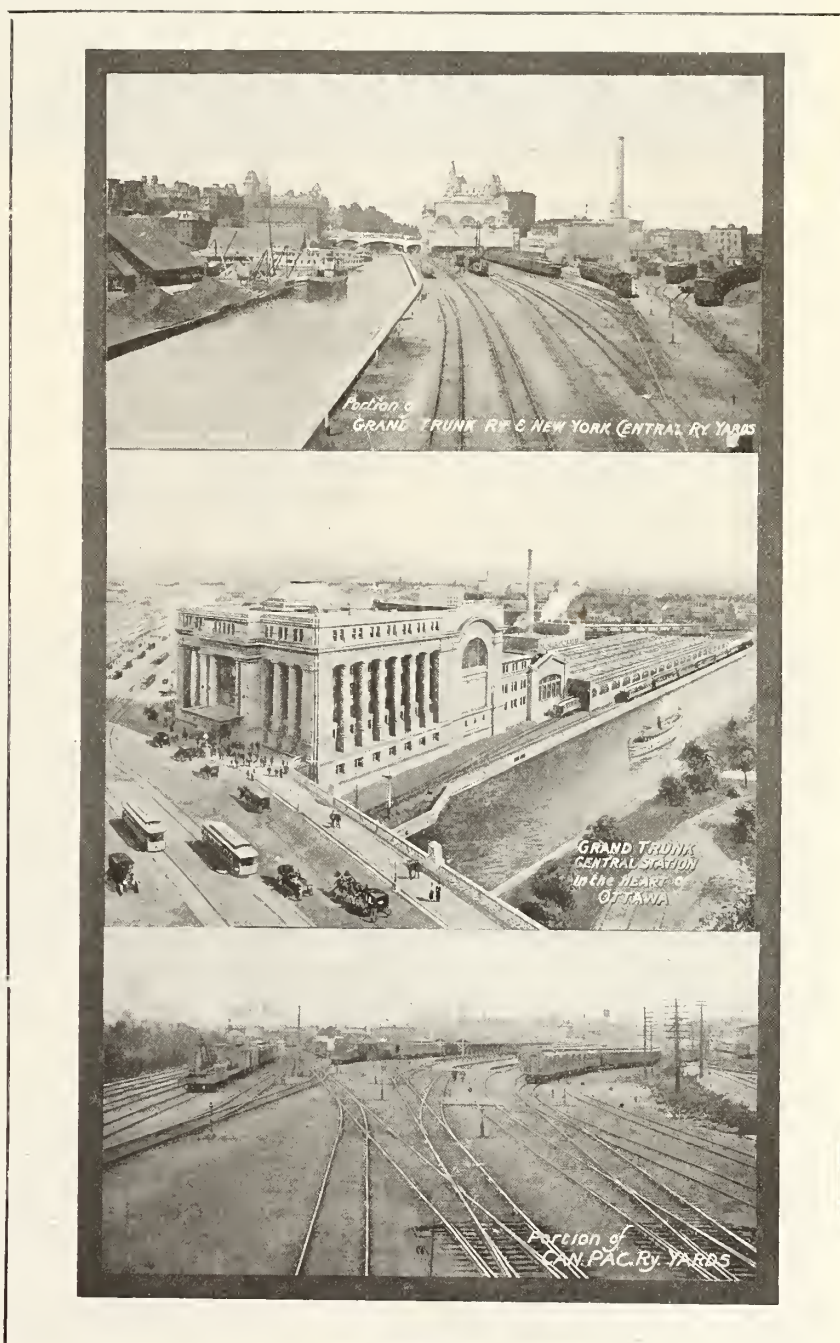
If perchance the visitor takes a Hull car to Ottawa, he will arrive at the en-

trance of the Chateau Laurier. Looking a little to the right the General Post Office will be seen. Then, by crossing Connaught Square to Elgin Street, he can board an Elgin car, traveling down to the foot of the hill. The next scene of interest will be Cartier Square, with the Drill Hall and Government Military Ordinance Stores in the rear. Next will be seen the Normal School, with the Collegiate Institute in the rear, until at last the car takes the visitor to the new Victoria Museum. This building is one of the finest on the continent, and is splendidly equipped with the finest sanitary and heating engineering. It is heated by a hot water system which was installed by the firm of Blyth & Holloway. These gentlemen both are members of this association, but are now interested in separate establishments. Mr.

Blyth is the able chairman of the legislation committee, and Mr. Holloway is the worthy secretary of the association. Referring again to the sanitary equipment, which comprises the very best and most serviceable, there is also an up-to-date vacuum cleaning system.

The Government Driveway.

The Government Driveway is a sight which, if time permits, should be visited. It extends practically from Rockcliffe Park via King Edward Avenue. Crossing the heart of the city it is again arrived at via Cartier Square, along the banks of the Rideau Canal, and on through the Exhibition Grounds, crossing Bank Street and on to the Experimental Farm. This is acknowledged to be one of the finest driveways in Canada, if not on the continent.





A pretty scene on Parliament Hill, Ottawa.

Arriving at the Experimental Farm, where by repeated experiments useful data on the seeding, cultivation and harvesting of farm crops, on the breeding, feeding and housing of various classes of live stock, and on the conversion of milk into other marketable products, the management of the whole is, as far as possible, conducted for profit, all operations being carried on after the most

approved practical methods. The live stock consists of four classes of animals; namely, horses, cattle, sheep and swine. A small dairy for the care and preparation of the milk for the market is operated. Poultry is also an important department.

Dominion Observatory.

Near the north gate of the Experimen-

tal Farm is the Dominion Astronomical Observatory. This building is of Romanesque architecture, carried out in grey sandstone trimmings. The main building was begun in 1903 and occupied in April, 1905. A wing for a "transit" house was added in the following year. The total cost was approximately \$175,000. In the interior a central octagonal tower is surmounted by a revolving



A few hotels in the Capital.



A busy day on By-Ward market.

hemispherical dome, under which is the telescope. There is also an astronomical library, reading-room, photographic-room and lecture-room.

Manufacturing Centre.

Many of those attending the convention will have time to pay a visit to some of the important industries. It must not be forgotten that while Ottawa is one of the most beautiful cities in the Dominion, it is quite an important manu-

facturing centre. Several of the largest industries in the country are located in the capital.

There are about two hundred industries in Ottawa and Hull, giving employment to about 20,000 persons, and paying out in salaries about \$8,500,000 per annum. The district output of lumber for 1912 aggregated 559,000,000 feet, board measure, valued at \$16,800,000.

In conclusion, if after the convention the visitors from the western cities wish to enjoy a steamboat journey, they may do so by taking a Rideau Canal boat as far as Smith's Falls or Kingston, and will enjoy, without fear of contradiction, the finest trip in Canada via the Rideau River and lakes. En route will be seen the most historic feats of engineering in Canada, which were performed by Col. By for military purposes.



The Niagara's of Ottawa.

Canadian D. S. and H. Engineers' Annual Convention

The Nineteenth Annual Convention of the Canadian Domestic Sanitary and Heating Engineers Will be the Most Interesting Convention Ever Held — Elaborate Preparations Are Being Made to Entertain the Visitors.

TIME waiteth for no man, and in a few days some of those present at the last convention which took place in Montreal last year will be partaking of a hearty handshake from members whom they have not met since that time. After the greetings have been passed round there will be much to be done. The Maritime Provinces will be represented by D. J. Shea, Fredericton, N.B., Wm. Watson, A. H. Farrell, Fredericton, and G. S. Dorman, Moncton, N.B. The Montreal and vicinity association which takes in the Quebec Province, will be represented by



Jos. Thibeault, Montreal, one of the old guards of the National Association.

John A. Gordon, John Watson and J. E. Walsh, all of Montreal. The Ontario society will be represented by the following directors, H. Hick, George Claperton, L. Legrow, F. R. Maxwell, G. F. Frankland, all of Toronto, as well as London's hustler in the person of E. H. Russel, and of course the Ottawa members are in the Ontario society. Toronto, Calgary, Winnipeg and British Columbia will, it is expected have their full complement of standard-bearers, which no doubt will result in a crowded convention. Up to the time of going to



John Watson, Montreal, Vice-President.

press the various committees were busy preparing their reports so as to carry through their business in as able and satisfactory a manner as possible.

The following is a list of the officers who have been doing duty on behalf of the association during the past year, all of whom will be present:—President, John McKinley, Ottawa; vice-president, John Watson, Montreal; sec.-treas., C. P. Holloway, 373 Somerset street, Ottawa; Provincial vice-presidents, British



J. T. Blyth, Ottawa, chairman of Committee on Legislation.

Columbia, J. S. Anderson, Vancouver; Ontario, F. R. Maxwell, Toronto; P. E. Island, B. Shaw, Charlottetown; Quebec, John Gordon, Montreal; Alberta, E. McKnight, Edmonton; Manitoba, A. J. Hammond, Winnipeg; Saskatchewan, N. B. Roantree, Swift Current; New Brunswick, G. S. Dorman, Moncton; Nova Scotia, Mr. Godwin, Halifax.

Chairmen of Committees—Apprenticeship, W. C. Crawford, St. John, N. B.; Essay, J. E. Walsh, Montreal; Heating and Ventilating, R. J. McCauley, Montreal; Legislative, J. T. Blyth, Ottawa; Sanitary, Jas. Marr, Calgary.

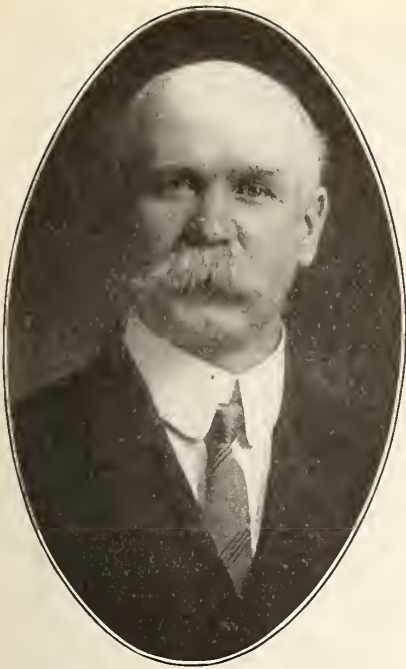
In looking into the personalities and



R. J. McCauley, Montreal, chairman of Heating Committee.

studying the characteristics of these men it cannot be doubted but that much good will be the results of their labors. John McKinley, president of the association, has for many years held a very dignified position in the estimation of every citizen in Ottawa. As a competitor in business he has always been fair. John Watson, of Montreal, makes a splendid vice-president, and is one of the old standbys of the national associations.

Those present at the last convention cannot fail but be interested by what he will have "on tap." Mr. Watson is



G. S. Dorman, Moncton, Prov. Vice-President for New Brunswick.

a known hard worker for the association and one of the charter members. His discussions are ever full of meaning and bear great weight to his hearers. C. P. Holloway the secretary-treasurer is a man of keen insight, and of few words but which when uttered are to the point. For many years he was a partner with J. T. Blyth.

The various provincial vice-presidents are all well known to the craft as being splendid workers for the association. The chairman of committees too are reported to have with them some very interesting reports to give; all are good association workers.

And in looking back at the times when sanitary fixtures and appliances were considered a luxury, when any old method would do, when sanitary engineers were simply plumbers, one cannot fail to realize that this band of men, all of whom are holding up the dignity of the craft must have been responsible in no small degree for some of the great strides which modern sanitation has taken.

At a lecture given by Dr. A. C. Mackay before the Toronto society recently he stated that "No body of craftsmen had accomplished so much, with so little technical training as had the sanitary heating and ventilating engineers." He said it was nothing short of miraculous. Almost every other branch of engineering advance in knowledge came by experiments and experience which in many scores of cases require as it were lives to be lost in the experiments. No loss of life has attended the accomplishments of the present sanitary and heating engineers. In fact the results were the reverse as all work done by this body of engineers aided to pro-



J. E. Godwin, Halifax, Prov. Vice-President for Nova Scotia.

long life, increase human vitality as well as giving comfort and convenience to mankind as a whole.

During the coming convention we feel sure those present will realize that much will be expected of one and all and that at this present time more so than at any other period in the existence of the craft, the sanitary and heating engineers are making history, upon which a great deal depend for the future welfare not only of the craft but of the whole human race.



J. E. Walsh, Montreal, chairman of Essay Committee.



A. J. Hammond, Winnipeg, Provincial Vice-President for Manitoba.

Points of Interest at Ottawa.

(Sparks Street Car Lines Used as Base of Directions.)

Place.	Street Car Sign.	Direction Bound.
Archives	Broad St. Sta.-Rockcliffe	East
Aylmer, Que.	Hull-St. Patrick	West
Aylmer, Que.	Aylmer	The Plaza
Britannia, Summer Resort ...	Britannia and Somerset	West
Basilica	Broad St. Sta.-Rockcliffe	East
Broad St. Station C.P.R.	Broad St. Sta.-Rockcliffe	West
City Hall (Elgin and Queen Sts.)	All Cars to Sparks and Elgin Sts.	
Court House, Nicholas St.	Bank and Laurier	East
Cartier Square:—		
Drill Hall, Normal, Model		
School, Collegiate Institute ...	Elgin St.	East
Chaudiere Falls:—		
Water Works Pump Station ..	Hull-Elgin	West
Can. Northern Ry. Depot	Laurier Ave.	East
Experimental Farm (460 acres)		
and Royal Observatory	Experimental Farm	West
Grand Trunk Central Depot:—		
G.T.R., C.P.R., N.Y.C. lines ...	All lines	East
Gov. Fisheries Exhibit,	All cars to O'Connor and	
O'Connor and Queen Sts.	Sparks Streets.	
Govt. Printing Bureau	Broad St. Sta.-Rockcliffe	East
Government House, "Rideau		
Hall"	Broad St. Sta.-Rockcliffe	East
Hull	Hull-St. Patrick	West
Parliament Buildings	All lines to Sparks and Metcalfe	
Public Library and Y.M.C.A. ...	All lines to Sparks and Metcalfe	
Post Office and Plaza	All lines	East
Protestant Hospital	All lines	East
Royal Mint	Broad St. Sta.-Rockcliffe	East
Royal Observatory	Experimental Farm	West
St. Luke's Hospital	Elgin St.	East
Victoria Museum:—		
Geological Exhibit	Elgin St.	East
Art Exhibit	Elgin St.	East
Water St. General Hospital	Broad St. Sta.-Rockcliffe	East
DRIVEWAY	ANY MOTOR BUS OR TAXI-	
	CAB LINE.	



Left to right.—F. R. Maxwell, Toronto, Provincial Vice-President of the Canadian Domestic, Sanitary and Heating Engineers; and John Wright, an old reliable Toronto Standby.

THE ONTARIO SOCIETY OF DOMESTIC SANITARY AND HEATING ENGINEERS.

A Circular Letter Showing Why Every Earnest Live Member of the Profession in Ontario Should Join This Society.

As one engaged in the business of sanitary plumbing and heating in the Province of Ontario, we wish to draw to your attention the benefits to be derived by becoming a member of the above society.

The society is working under a charter granted by the Province of Ontario in 1911. To promote the business of heating and sanitation, with a view to organizing those persons who are qualified therein, to allow these trades to insure a standard of efficiency, for the protection of the public, and for the persons engaged in such business in the Province of Ontario. To the end that we may create and foster feelings of fraternity and social intercourse amongst members of the craft, and in addition the promotion of the following special objects: The advancement of the trade in its sanitary, heating, commercial, mechanical, and scientific department. Also for its protection against imposition, injustice or encroachment upon its common rights and interests, and to assist in the enactment of an Act for a minimum sanitary and heating by-law for Ontario.



Lewis Legrow, Toronto, Director of Ontario Society.



Harry Hick, Toronto, President of Ontario Society.

The membership is comprised of the best engaged in the trades from all parts of the Province. And if you are one of the live ones in your district, get in touch with the secretary. He was appointed permanently at the annual meeting in March, and will furnish you with any required information regarding the society.

At the present time the society are dealing with many questions pertaining to the trades, including the following:

The Workmen's Compensation Act, which was passed in Ontario at the Session of the Legislature just finished. This affects everyone engaged in the plumbing and heating business in Ontario, and requires the united support of the trade in the province to obtain the best conditions for our class.

A Provincial sanitary by-law for Ontario. Data from most all parts of the Province has been secured regarding local conditions. And everyone must realize the necessity of a united stand in this matter.

The act for steam boilers for Ontario is the forerunner for further legislation in regard to the heating trades.

Standard heating specifications, standard apprenticeship indenture, retail price list and estimate sheets and technical education.

There are many question, both local and otherwise, which can only be dealt with satisfactorily by an association. And we know that we have the power and ability to do anything and everything for the general welfare of those engaged in the plumbing and heating trades in Ontario, if we have their support and assistance.

Upon request, the secretary will forward a copy of the report of the third annual meeting of the society, which was held in Toronto, on March 19th, 20th

Chamber of Commerce, Winnipeg, Man., is to represent them in Western Canada.

Both these men are well known to the trade who will appreciate the fact of



James Marr, Calgary, chairman of Sanitary Committee.

and 21st. This will show the progress the society is making.

The society needs your assistance, and you need the help of the society. So please show your appreciation of what has been done, by acknowledging the receipt of this letter, with approval, criticism, suggestions or the request for information, all of which will be courteously received and attended to by the secretary.

Thanking you for your kind consideration of this matter, and awaiting your early response, we are,

Respectfully yours,

The Ontario Society of Domestic Sanitary and Heating Engineers, per

G. F. FRANKLAND,
Secretary.

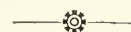
1093 Bathurst St., Toronto, Ont.



AGENTS APPOINTED TO HANDLE POPULAR LINES.

It will be of value to our readers to know that the Beaton & Cadwell Manufacturing Co., New Britain, have appointed two Canadian agents to handle their popular lines. J. R. Devereux, 142 St. Joseph Boulevard, W., Montreal, has been appointed to represent them in

Eastern Canada, and A. E. Hinds & Co., being able to place their orders for such lines as floor and ceiling plates suitable for every known condition, automatic, wood wheel and key valves. Various kinds of pipe hangers, steel pipe rolls, foot rests for radiators, galvanized and tin adjustable pipe sleeves, expansion bolts and a number of other steam specialties. Those who would like to procure a list of lines manufactured by Beaton & Cadwell, may do so by communicating with their agents or to their main office, New Britain, Conn.



WHO MAKES SANITARY DRINKING FOUNTAINS?

Editor Sanitary Engineer.—Kindly give us the names of manufacturers of sanitary drinking fountains for use in stores, and oblige.

R. F. HOLMAN, Ltd.,
Summerside, P.E.I.

Empire Brass Mfg. Co., Ltd., London, Ont.; Jas. Robertson Co., Ltd., Spadina avenue, Toronto; James Morrison Brass Mfg. Co., Adelaide street, Toronto; Puro Sanitary Drinking Fountain Co., Haydenville, Mass.

—Editor.



G. F. Frankland, Secretary Ontario Society.

Sanitation Made Panama Canal Possible

Showing That Sanitation May be Practised Anywhere—That Our Villages Can Be as Sanitary as Large Cities—That the Panama Canal Would Have Been Almost an Impossible Task But for General Gorgas and His Methods of Sanitation.

A FEW years ago sanitary engineers thought it almost an impossibility to give the residents of rural districts, villages and towns the same sanitary conveniences as our large cities, because of the fact that the above-named had no sewers or drainage systems at their disposal.

In warfare the military authorities were confronted with the same problem, that of being able to keep their camping grounds in a sanitary condition. For instance, in the year 1763, the British were compelled to leave Cuba after they had captured Havana because of the death-dealing diseases which overwhelmed their army. The writer was in conversation with an old army veteran some 20 years ago, who had participated in the Abyssinian war, the battle of Tel-el-kebir, and several others, and the pictures poured forth about the unsanitary conditions which our British army had to bear, showed that they were by far more to be feared and dreaded than the enemies. This old veteran said: "Yes sir, I've heard it said that 'War is Hell,' but it's nothing in comparison with the sickness and suffering in the camp which is unsanitary. I've had my comrade by my side just on the verge of taking fever, and we've been ordered to the firing line, and, when a bullet had pierced his heart, he has cried out 'Thank God,' because instant death was more to be desired than the awful suffering caused by sickness."

In 1846, the Americans entered Mexico, knowing little of the tropical diseases, and though suffering severely, had not learned sufficiently to be of much use in coping with the diseases 52 years after. That was in 1898 during the Spanish-American war. It was one of the worst handicaps they had to cope with.

However, since that time much has been learned, and to William L. Gorgas, Surgeon-General, U.S.A., must be given a great deal of credit. General Gorgas speaking of sanitation said in part:

"In any contemplated occupation of a country lying partly in the tropics by an army coming from the temperate zone there would be two stages to consider with reference to the precautions necessary to the preservation of the health of such a command—first, the measures required to avoid the camp diseases in the homeland while the troops were mobilizing and training, and, second, the measures required to avoid the diseases peculiar to the country to be occupied. It may be added that under the latter circumstances there might be camp diseases in the occupied country, the same as in the home country.

"The first sanitary precaution is to secure healthy soldiers—physically sound men. Then it is necessary to safeguard their health while in training by giving them pure food, water, and healthy camp surroundings and by preventing the entrance to such camps of infectious diseases. Our camps in this country would naturally be selected with a view to salubrity.

"The supply of water must be given the same care and safeguarding that the supply of one of our cities receives. The selection of sites for large camps of concentration is influenced to a greater extent by this one matter than by any other consideration but military necessity. In successfully taking all precautions relating to water we assist in avoiding typhoid fever and the dysenteries—the camp diseases of all former wars. These diseases are also communicated by foods of some kinds, particularly the uncooked ones, and milk. Consequently, the sanitary officers must inspect and examine the water and food, including milk, with the special purpose of keeping out the diseases thus transmitted."

It was General Gorgas who made it possible, without serious loss of life to accomplish the building of the Panama canal more than any other being and while, no doubt, Colonel Goethals will always be credited with the actual engineering accomplishments, these were made possible, by the fact of having healthy men around him. Sick men are a drag on any engineering camp, and we cannot conceive of such a stupendous undertaking being brought to such a successful issue under the unfavorable circumstances which would have existed had it not been for the wonderful preventative measures against sickness, which General Gorgas put into practice.

General Gorgas and his medical army made the Panama canal district as free from infection as any part of Canada or U.S.A. and infinitely more healthy than many of our country villages are to-day, where dunghills, cesspools, putrefied ponds are as common as the filthy mosquito. If the medical health officers in these small towns and villages would take a little more interest in preventative measures, than in cures they would be worth infinitely more to their localities than at present.

Therefore, when we sanitary engineers call to mind the great Panama canal project let us not forget to link with Colonel Goethals the name of General Gorgas, as being the forerunner in the undertaking.

AN ANNOUNCEMENT OF THE OTTAWA CONVENTION.

The annual convention of the Canadian Society of Domestic, Sanitary and Heating Engineers will be held in Ottawa from June 9th to June 11th. The officers of the Society who are living in Ottawa have been hard at work in preparations for this Convention. In order that the business end of the meetings should have the time and care of the officers the Executive Committee asked the local Ottawa Association to kindly take care of the entertainment part of the program. The local Ottawa Association has come to their assistance and a strong committee consisting of the following: Messrs. M. M. O'Connell, A. H. Currie, E. Gauthier, E. A. Band, and C. P. Holloway was named and this committee has also been hard at work.

Through the generous response of the manufacturing and jobbing houses throughout the Dominion, a handsome sum of money has been placed at the disposal of the entertainment committee and their promise is to make this part of the Convention eclipse anything in its line in any previous year. It is hoped that as many as possible from all over Canada whether accredited delegates or not will avail themselves of this opportunity to visit the Capital City. Every member of entertainment is keenly alive to the beauty of his city and the prospect of the royal entertainment of their friends from sister cities and towns. At this writing it is impossible to make any special arrangements with hotels as the number of delegates is not known but hotel accommodation can be found to suit the requirements of everyone and the various hotel proprietors have been notified and will do all in their power to look after the comfort of their guests. In order to facilitate arrangements intending visitors should advise the secretary, Mr. C. P. Holloway, Somerset St., Ottawa, of their intention to attend the Convention.

St. Patrick's Hall, Laurier Ave., has been selected as the place of meeting. It is conveniently situated, but a few minutes from the leading hotels and is fitted with ante-rooms and every facility for the transaction of business, while at the same time it is sufficiently removed from the centre of business to insure quietness and facing the beautiful driveway offers a convenient place of assemblage for the purpose of automobile drivers, etc. Ottawa says: "Let every Sanitary and Heating Engineer take a day or two off and come to the capital, bring his wife and family and have a royal good time." The officers of the Canadian Society are now working on the business program and the subject matter for discussion is of vital interest to every Sanitary and Heating Engineer.

Every prominent manufacturing and jobbing house has arranged to have representatives in Ottawa during the Convention, in fact the chief heads of these houses have signified their intention to be present and thus an opportunity will be afforded to all to become better acquainted with each other. Trusting you will find means of publishing this information, I remain,

Yours sincerely,

C. P. HOLLOWAY,
Secretary.

The Sanitary Engineer

Plumber and Steamfitter of Canada

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Circulating amongst Sanitary, Heating and Ventilating Engineers, Gas Fitters, Sanitary Inspectors, City Engineers, Boards of Health Architects, etc.

TORONTO, JUNE 1, 1914

THE NINETEENTH ANNUAL CONVENTION.

A GAIN we are looking forward to another annual convention, and in doing so cannot help but remember the busy time spent last year in the City of Montreal. It was a red letter convention, was that one; and if all we hear is true we are to have one of the most interesting conventions ever held in the history of the Association. Speaking to the president, John McKinley, Ottawa, he said: "Well, we haven't very much to tell the Sanitary Engineer, but we will have lots to talk about when the right time comes." Mr. McKinley is a man of few words anyway, but he can "talk less and say more" than lots of men, and that's what counts these days. One thing Mr. McKinley did say, and that was that they were going to give the boys the time of their life. So all Sanitary Engineer wishes is, to see all members with their wives at the convention this year. Don't forget the date, June 9, 10 and 11.

THE PLACE OF MEETING.

THE convention is to be held in St. Patrick's Hall, Laurier Ave., facing Cartier Square. It is one of the best equipped buildings in Ottawa for convention purposes. Several ante-rooms will be available with no street cars or other noises to disturb the speakers. It is located within a few minutes' walk of the best hotels and railway stations. Therefore it is only reasonable to believe that under such favorable conditions much work will be accomplished in as short a time as possible, leaving plenty of time to take in some of the beauty spots of Canada's capital, of which there are many.

SANITATION A MODERN MIRACLE.

IN ANOTHER article the subject of the Panama Canal and sanitation is taken up, showing what has been accomplished under the most trying circumstances, and in that article we would wish to bring the firm conviction of a duty which every sanitary engineer has taken upon himself. Sanitary engineers can do individually as much in their own way, in their own little town or village, as General Gorgas did in the Panama Zone, if they will realize their position and the responsibility which is theirs. Sanitary engineers can do more to cope with the unsanitary conditions which prevail in our small towns and villages, where there are no sewerage systems, than all the medical fraternity born or unborn, proving

in a most vital way that "one ounce of prevention is worth a pound of cure."

ECHOES OF EDMONTON CONVENTIONS.

THE Canadian Institute of Sanitary Engineers held their annual convention less than a month ago and at this early date we are able to publish the good news that most of the recommendations put forth at this convention have already been made law. It is quite evident these members believe in striking while the iron is hot and in doing so have accomplished much for sanitary engineering construction in the Western provinces.

VITAL STATISTICS.

IT HAS often been said that the subject of vital statistics is one which is too dry to be interesting. Well, that may have been truly said in the days of long ago, but to-day when we are beginning to realize that every healthy human being is of an economic value to the nation to which he belongs, the subject must of necessity lose its dryness. We are publishing a series of articles dealing with this subject, written by Professor Whipple of Harvard University, and all sanitary engineers should read them. Readers will, we feel sure, be more convinced of the part they should play, and play it with more interest, thus becoming more of a professional benefactor to the public at large.

THE PRICE-CUTTING EVIL.

IT is sad to hear so many complaints of the evil of price-cutting. Now that business is looking up and in a short time work will be plentiful, why in the name of common-sense can't those engaged in the craft stand by their guns and kill this evil once and for all? Of course we know this is a problem which will require hard work, but those who are doing the price-cutting can best be gotten rid of by simply allowing them for a short period to hold sway; and no doubt the period will be short, for the simple reason that, at prices which work is being taken they cannot hold out. The writer was speaking to several members of the trade recently who complained bitterly but who are holding out for their price or not taking the work. The writer was looking over a house recently which was being finished and in conversation with the contractor who was the owner of the house, was told that he had put up scores of houses in his time and had always paid a

pretty big price, but on account of the recent tightness of money he began to look around for lower prices and was now able to get a whole sanitary outfit comprising 4½ ft. bath, D-oval basin, low-down tank, w.c., 16 x 24 roll rim sink, and 30-gal. range boiler for less than \$150, all fittings being nickel-plated. Now every one knows that such an amount of work and goods cannot be installed for that sum, and the man who is doing such work will not be in business long. There is no disputing the fact of the work being done at that price, because the writer was given ample proof.



THE STANDARDIZATION OF SOIL PIPE.

THIS recommendation could not well be carried through, for the simple reason that it is a problem which will affect the whole Canadian trade, and we hope to see other associations take the matter up in a good, live manner so as to have it put into effect as soon as possible.

As we stated recently in Sanitary Engineer that while this problem does not affect the trade to any great extent in the Eastern provinces, it is a very vexed question in the Western provinces; therefore to enable our Western craftsmen to get better results we hope all the craft throughout Canada will see to it that the standardization of soil pipe and fittings is taken up and put into effect as soon as possible.



TEXT OF THE TIPPING BILL.

SENATOR DAVIS' BILL to put a stop to the tipping nuisance is an amendment to the Secret Commissions Act passed in 1909 to prevent the giving or receiving of secret commissions. The amendment in full is as follows:—

1. The Secret Commissions Act, 1909, is hereby amended by inserting therein immediately after section 3 the following as section 3-a.

"3-a. Every one is guilty of an offence and liable upon summary conviction, to two months' imprisonment or to a fine not exceeding one hundred dollars, or to both, who:

"(a) being an employee or servant, accepts, obtains, or agrees to accept, or for any other person, any gift, gratuity or consideration as an inducement to perform or as a reward for having performed, any duty or service for which such employee or servant has been or is to be paid by the employer or master of such employee or servant, or—

"(b) being an employer or master, permits or allows any of his employees or servants to solicit or to accept any gift, gratuity or consideration, as an inducement to perform or as a reward for having performed any duty or service for which such employee or servant has been or is to be paid by such an employer or master, or,—

"(c) gives, agrees to give, or offers to any employee or servant any gift, gratuity or consideration as an inducement to perform or as a reward for having performed, any duty or service for which such employee or servant has been or is to be paid by the employer or master of such employee or servant."

The last clause is the one that hits directly at tipping and from all appearances the bill will be passed. Opposition is not at all serious so far as the discussions up to the present are concerned. The first three clauses of the amendment, while they appear to be covered by the Secret Commissions Act of 1909, are of importance because they further recognize the principle laid down in that act.

The Business Situation

JUDGING by the reports received from various parts of the country, it is encouraging to note a general improvement in the sanitary and heating trades. Various newspapers have advertisements for "plumbers wanted," and building operations are becoming very brisk. Those who have not as yet felt much improvement would do well to check up their stocks, and put them into shape for a busy season. Of course, it may not be quite as busy as last year, but what work does come along will be of a steady nature. In Montreal there has been quite a little activity on the part of the health inspectors which has resulted in a fairly good quantity of repair work being done. Toronto employers are beginning to feel a decided improvement and quite a number of the moderate-sized shops report being busy. Building operations in and around Toronto are becoming more prominent and will, no doubt, result in a fairly good year's business. The buildings put up this year will be more of a residential nature than of factory or office buildings.

A better class of fittings and fixtures will be on demand this year than ever before. The public are beginning to realize that a higher grade of goods particularly in the sanitary and heating line are by far better value and give better service than cheap, low-priced goods.

The metal market is easy, and goods were never at a more favorable buying price, all things considered. Money is easier by far than was reported a few months ago.

One thing though, which is to be regretted, is the appearance again of the price-cutting bee. Why sanitary engineers should resort to price-cutting just when business is opening up, is to say the least, ridiculous, because of the very fact that there will be all the business which can be handled this season comfortably and so little money has been in the trade recently in comparison to the amount of energy put into the business.



EDITORIAL COMMENTS.

ALL ABOARD FOR Ottawa on business and pleasure bent.

* * *

DON'T LET BUSINESS interfere with pleasure, but rather inoculate business with pleasure.

* * *

IF YOUR BUSINESS is not real pleasure to you, it is not real in any sense of the word and cannot become a success.

* * *

THERE NEVER WAS a price-cutter but what had a sneaking conviction that his business method did not ring true.

* * *

WHEN PRICE-CUTTING is being resorted to, those involved should remember that good old saying: "The receiver is as bad as the thief."

* * *

HONESTY IS THE BEST policy, but to be honest in actual fact means that we are no more honest when robbing ourselves than if we were robbing our neighbor.

* * *

THE MAN WHO maintains his price is typical of the 'British' Bull Dog saying: "What I have I hold."

* * *

THE MAN WHO cuts prices says in actual fact: "What I have I won't hold long."

Vital Statistics in the Public Health Service

By George C. Whipple, Consulting Engineer, New York City. Professor of Sanitary Engineering, Harvard University.

VITAL statistics, to be of benefit to the community, must be used with truth, with imagination, and with power. The essential requisites are, first, that the data be accurate and sufficiently complete; second, that the inferences and conclusions drawn follow logically from the facts collected; and, third, that the results be so displayed as to be readily understood and compel attention. If properly used, there is no keener weapon at the service of the sanitarian in his fight against the forces of disease than vital statistics, but improperly used they lead to inaction on the one hand or to extravagance on the other hand.

It is of the greatest importance to a nation that accurate records be kept of its vital capital, of its gains by birth and immigration, and of its losses by death and emigration, for a nation's true wealth lies not in its lands and waters, not in its forests and mines, not in its flocks and herds, not in its dollars, but in its healthy men and women and in its children. A well man is worth more to a nation than a sick man; a man in the prime of life is of more immediate worth than an old man or a child; a married man is a greater asset to the community than a single man. Hence in a nation's vital bookkeeping, the number of people, their age and sex and conjugal condition, their parentage, their health, and the rate of births and deaths, are matters of great moment. Their environment is also important, their concentration in cities and villages and congested areas, their mode of housing, their occupation, their state of intelligence, their knowledge of sanitation, all contribute to the sum total of their usefulness to themselves and to society.

Vital bookkeeping is carried on much as ordinary bookkeeping. There are daily entries of accessions and losses as they occur, corresponding to receipts and payments; there are weekly statements, monthly statements, and annual statements; and at longer intervals there is a taking account of stock—that is, a census. This difference, however, should be noted. Accounts are accurate records of transactions, and, if properly kept, an exact balance will be obtained. Vital statistics are not always accurate. The individual data are incomplete, and subject to error. The results, therefore, lack the precision of monetary accounts. It is necessary to keep this fact con-

stantly in mind when interpreting the results of statistical studies. An understanding of the arithmetic of inexact numbers and of the theory of probability is essential to a health officer who desires to become proficient in this branch of his work.

Among the books that might be profitably consulted for this purpose are Yule's "Introduction to the Theory of Statistics," Bowley's "Elementary Manual of Statistics," Elderton's "Primer of Statistics," and, best of all perhaps, King's "Elements of Statistical Method."

Engineers Should Consult Vital Statistics When Planning for Future Demands.

Vital statistics are useful for many purposes. To the historian they show the nation's growth and mark the flood and ebb of physical life; to the economist they indicate the number and distribution of the producers and consumers of wealth; to the sanitarian they measure the people's health and reflect the hygienic conditions of their environment; to the sociologist they show many things relating to human beings in their relations one with another.

But vital statistics are not to be collected and used as mere records of past years; an even more important use is that of prophesying the future. An engineer in planning a water supply to last for a generation estimates the future population by the previous rate of growth; so, also, in laying out a system of streets, sewers, and transportation service, the engineer must look ahead. The whole idea of city planning is fundamentally based on the use of vital statistics of what has been as a means of estimating what is to be.

The Duties of a Health Officer.

The health officer of a city, or he whose duty it is to collect and record the vital statistics, should study them as soon as received, and not wait until some convenient day when other work is slack, and then merely tabulate and compute averages for formal reports and permanent record. The health officer must learn that vital statistics are not collected as a source from which to write history; not as chapters in a book that is closed; but that they are facts upon which future action is to be based; they are the portents of good or evil that is to come. From the cloud no larger than a man's hand it is the health officer's business to discern the coming storm.

I once knew a health officer who told me that he never looked at the reports of death as handed in by the physicians until the last day of the month, when he made up his report. He said that he had little interest in vital statistics, that they were a nuisance, and the necessity of keeping them kept him from attending to more important duties. It is no wonder that he never took any interest in them, for he had never really made use of them, and did not know what they were for. That there are other health officers like him is shown by the fact that many an epidemic has started and attained momentum in a community, and even been described in the daily papers, before the health officer realized that the epidemic existed.

On the other hand, I know health executives who follow the daily records of infectious diseases with a scent as keen as that of a dog following a fox, and who by their faithfulness and zeal have saved a community from untold ills. Such a one told me that to follow these figures was the most thrilling work of his life.

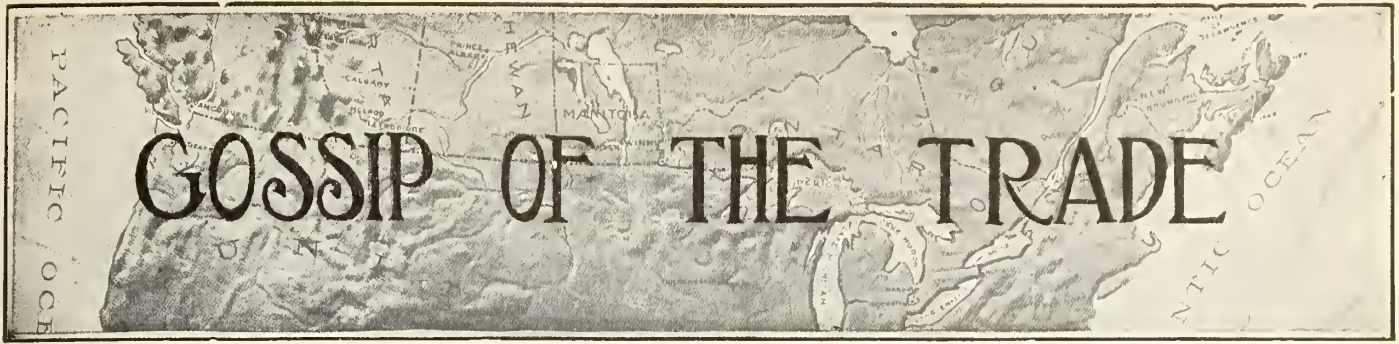
Just as the meteorological observer reads his instruments daily in order to forecast the weather and give warnings of the coming hurricane, so the efficient health officer will daily study the reports of new cases of disease in order that he may be forewarned of an impending epidemic and take measures to check its ravages. No lighthouse-keeper on a rocky coast is charged with greater responsibility than he who is set to watch the signs of coming pestilence from the conning tower of the health department.

Vital statistics must be used hot; otherwise they are stale, flat, and unprofitable. But if vital statistics are to be used they must first exist.

No Uniform Registration Laws.

It is a surprising thing to find that in the United States, and I have no doubt that this is true also in Canada, the important demand of this twentieth century is not for a better and larger use of vital statistics, but for their very existence. We have as a nation no adequate and uniform registration laws, no annual tabulations of births and deaths, and hence no foundations upon which to build the science of American demography, a science which stands as the very basis of modern sanitation. In this respect we are far behind other civilized nations of the world.

(Continued on page 28.)



A GARDEN AND DINNER CLUB.

Practical Pleasure.

ONE of the most practical ways to promote a pleasureable and profitable spirit amongst one's fellow-workmen and employees is the way which the H. Mueller Manufacturing Co., Ltd., Sarnia, conduct what is known as their Garden and Dinner Clubs.

The Garden Club.

First of all the company furnishes the land, and those who are interested in the club make a deposit of \$5 each at the beginning of the season, the money being used to buy seeds, plants, etc., and for the purpose of plowing the land during the year, and other necessary expenses. The planting is done by the members themselves, as is also the work of weeding, hoeing, etc. Certain nights are set aside for the work of each member, and if he finds it inconvenient to take care of his share of work at any time, he has to hire someone to take his place.

As the truck ripens, each member gathers whatever he wants from the garden and reports same to the treasurer of the club, who charges him the regular market price for same. At the end of the season, potatoes and things of that nature are harvested and distributed equally among the members, and the money which has been collected for the truck sold is distributed equally among the members.

The Dinner Club.

Owing to lack of accommodation the membership of this club is limited to foremen, assistant foremen and office staff.

To become a member of the dinner club a deposit of \$1 is required, which created the necessary capital for starting the club. Two members serve as commissary committee for two weeks, a new member being appointed each week, and the old member of the committee becoming chairman. The chairman of the commissary committee plans the meals and does the ordering, and an accurate account of the money spent by him is kept and a report made by the treasurer on the Tuesday night of each week, showing just how much he has made or

lost for the club during his period as chairman.

This creates quite an interest and makes some competition to see who can furnish the best meals for the least expense. The meals are charged for as follows:—

One meal during the week.....	35c.
Two meals during the week.....	65c.
Three meals during the week.....	85c.
Four meals during the week.....	\$1.00
Five meals during the week.....	\$1.25
Six meals during the week.....	\$1.25

The reason this scale of charges was arrived at was by the fact that some members who only stayed to dinner on a rainy day or twice a week would not be entitled to his meals at the same rate as those who stayed every day, and the plan works out splendidly.

Though it is some time ago since the writer was a guest of the members of H. Mueller Co.'s dinner club, he has not forgotten the spread they were able to put before one. The fact that Mr. Oscar Mueller has to take his turn as chairman of the commissary committee in the ordinary course is sufficient proof that the dinners are no small affairs by any means, and much can be said in favor of schemes of this kind, which are not only profitable, but pleasant, and a great convenience to each and every member of the club.

SANITATION DAY.

Thursday, May 21, was "Sanitation Day" in the clean-up and paint-up week programme in Montreal, and ex-Mayor Dr. J. J. Guerin, who as chairman of the Sanitation Committee was in charge of the day's activities, issued an open letter to the citizens in which he urged the importance of sunlight, pure food and pure air. In the course of his letter he said:

"The first precaution every responsible tenant should take is to see that there are no foul gases escaping into the home he inhabits. Foul air debilitates the system by rendering a person prone to contract any kind of infection. Little children especially who are exposed to noxious gases rapidly become debilitated and anaemic, and in conse-

quence lose their power of resistance when exposed to infection.

"The first precaution, therefore, a tenant should take on entering a new residence is to see that the plumbing is in a sanitary condition."

PLUMBING IN COBALT TO BE INSPECTED.

At the last meeting of the town council, Councillor McEachren suggested that steps be taken to have somebody supervise the plumbing which is done in town. He remarked that in many instances the plumbing was in a most disgusting state, and requested the council to take the necessary steps to eliminate the danger of any serious after-effects, which might result from congestion, etc. The measures taken by the Sudbury Board of Health in an instance which was brought to their attention are certainly worthy of consideration.

PLUMBERS ASK TO BE REGISTERED.

The Fort William plumbers want to be examined, registered, licensed and bonded similarly to the Port Arthur plumbers. They want it badly and this morning a deputation of them waited on the council at the eleven o'clock session, asking that a by-law be passed.

Two years ago a by-law to do this, was considered by Fort William, but dropped. This proposed legislation was read to them and they asked some amendments so that it would conform to the Port Arthur law.

Mayor Young promised as far as he is able to promise, for the council, that a by-law would be introduced. In Port Arthur it was said that all plumbers have to furnish \$500 bond. They pay a license of ten dollars for the first year and for additional yearly licenses, \$2 and they have to pass an examination set by one master plumber, one journeyman and the plumbing inspector.

It was pointed out that the Fort William plumbers are at a disadvantage. They cannot figure on work in Port Arthur unless they have complied with the Port Arthur by-law, while the

Port Arthur fellows come over here and do not have to pay anything. In this way a plumber with an establishment in Fort William is handicapped.



PLUMBER MAY DIE AS RESULT OF BURNS.

Alfred Nickson, a plumber, living at 803 St. Clair Avenue, Toronto, was seriously burned recently while at work. With a number of other men he was placing some plumbing in a house when a quantity of gasoline exploded when it came in contact with a blow torch. Nickson was burned on the face, neck, arms and legs. He was taken to St. Michael's Hospital. His condition is critical. John McLean, 63 George Street, who was working with Nickson, was also slightly burned, but after being treated at the hospital was able to return to his home.



NEW PLUMBING BUSINESS.

Mr. Fred Cook, Woodstock, who for some months past has been engaged in the electrical business, is opening up another department by adding a sanitary and heating engineering department. His present address is 545 Mary Street.



HOT WATER SERVICE HEATERS.

The above is the title of a very attractive booklet published recently by F. L. Patterson & Co., New York. It contains some very useful information showing various methods adopted by steam users to supply hot water for domestic purposes or otherwise. Any of our readers may procure this book by writing F. L. Patterson & Co., 26 Cortlandt Street, New York.



"I WAS NOT PAID TO DO THAT."

By Frank Andrews Fall, in Detroit Free Press.

Fifty-dollar-a-month-men are a drug on the market, while fifty-dollar-a-day men are not to be found anywhere.

Why is it? Why this great army of mediocre workers and this pitiful scarcity of men with energy, brains, and initiative?

One reason is that the dollar-a-day worker is too fond of saying the words used as a caption for this article. He continually side-steps opportunities for advancement which come to him disguised as extra work.

I was not paid to do that, he says, and I'll not do it.

Very well, says the employer, two can play at that game. If you'll do only exactly what I pay you for, I'll pay you

for exactly what you do, and not a cent more.

There is no future for such an employee in any business.

The wise worker sings a different song altogether.

I may not be paid to do that, he says, but if the boss will let me do it, I'll take a chance on getting the extra pay for it in due time. Meanwhile I'll be learning something more about the business.

Watch the workman who is so interested in his job that he stays after hours to work out some scheme he has devised in connection with his work.

He may get no pay for the overtime.

But his work is bound to show the extra punch, and soon or late his pay envelope must respond.

When the plant gets too big for one man to manage there's going to be a new position looking for a man, and the overtime worker will have first call, without a doubt.

So it behooves every worker, in whatever post of responsibility, to study his work. Analyze it, puzzle over it, try to improve its methods and its results.

Every boss is looking for help from the worker who can devise a newer, better way of performing an old task; who can cut out extra motions and thus help to bring down the cost of production.

But no boss has any use for the worker who complains; who always lugs a grievance around with him; who bewails and bemoans and sheds gloom generally.

When the boss feels the need of gloom he goes out for a ride with his friend, the undertaker. But he can't use the sob stuff around the plant.

Nor will he pay for it.



VITAL STATISTICS.

(Continued from page 26.)

This condition of affairs may be charitably regarded as a youthful sin of omission, but if it is much longer continued it will be nothing less than a national disgrace. It is gratifying to note that in the United States, and I hope also in Canada, there are indications of an increasing appreciation of this matter, and one after another of our states is adopting the standards of registration and report established by the Bureau of the Census.

Facilities for Reporting Made Simple.

But some one says, "I would use the data if the physicians would only report their cases." The proper reply to such a remark is that it is the business of a health officer to see that the physicians do report their cases. Where laws exist requiring such reports to be made, any physician who fails to do so

is in contempt of the law and deserves to pay the penalty. But physicians are busy men, and frequently it is of greater importance that they give attention to their cases rather than to the clerical work of preparing reports. Hence the mechanism for such reports should be made as simple and as convenient as possible. Arrangements might be made for receiving reports by telephone, to be confirmed later in writing. Dr. Levy, the efficient health officer of Richmond, whose work has become famous throughout the country, supplies each physician with a box, which can be conveniently placed on his desk, provided with all necessary blanks, post-cards and stamped envelopes for convenient mailing. Various methods are used for detecting the failure of physicians to report births and deaths and cases of disease. For example, if the death of an infant is reported, a search is made to see whether the infant's birth had ever been reported. If not, the physician attending the family is requested to furnish an explanation. In other ways similar to this the physicians have been constantly reminded of their negligence until they have come to take the matter seriously, and since the benefits of prompt reporting have been made evident, the physicians as well as health officers recognize that vital statistics promptly used are of practical benefit to the city in preventing disease as well as recording it.

Evils of Striking Averages.

It would be interesting to discuss some of the details of the collection of data and some of the probable sources of error, but time will not permit of our doing so, and reference must be made to the books above referred to. By way of example, however, one source of error may be mentioned, mainly that due to the use of round numbers. In recording the dates of past events, some will be given on the exact day of the occurrence, but where memory fails some are likely to be recorded as "on the first of the month," or "on the 10th," or "about the 15th," as the case may be. The same is true in regard to recorded ages. An ignorant person of age 41 or 39 is likely to give his age as 40, a round number which in his mind is near enough. Such figures when aggregated with others correctly stated give undue prominence to figures divisible by 5. The tendency to this error may be discovered by finding whether an undue proportion of the collected figures are divisible by 5 or 10 or 25 or 100. Another means of discovering it is by plotting the data.

It is easy to make a fallacious use of averages and ratios. Fictitious accuracy should be avoided. If 35 out of 57, balls

(Continued in next issue.)

Canadian Institute of Sanitary Engineers

Important Recommendations Adopted at Edmonton Convention—
Plumbing Department to be Separate From Other City Departments—Examination of Master and Journeymen Plumbers Discussed—New Cast Iron Fittings to be Named SAMO.

THE report of the proceedings of the Institute of Sanitary Engineers at their first annual convention, held in Edmonton last month, which appeared in the last issue of Sanitary Engineer, was complete only as far as the first two days of the convention were concerned. By far the most important work was done on the third day, excepting only the decision come to with respect to roof terminals, the effect of which has already been far-reaching.

At the Wednesday morning session the question of rain water leaders came up. Mr. Bulloch described methods adopted in Edmonton of connecting rain water leader to the roof, and also suggested that sand traps, as used in Edmonton for disconnecting leader from drains, over and above the round pipe trap with clean-out.

Mr. Vallance, Medicine Hat, suggested that if they were going to have an improved sand trap, it would be well to have something in the by-law stating what an improved sand trap was.

Mr. Mathias, Regina, pointed out that the sand trap was nothing more than an old mason's trap, and it should be properly on the waterline. If it was necessary to have a trap on the "Y," then it should be an inverted "Y."

Mr. Ochampaugh said he would like to see each of the traps have an end bowl with a cover. Mr. Mathias said this was a violation.

Mr. Nixon said he understood that they were all brick traps in Edmonton, connected with the sewer, which was a serious matter. If the water got foul during a dry spell it would be dangerous.

Chairman—It has been moved that this report be adopted, with the provision that any form of construction of cement or brick which goes to form a seal or trap—in other words, that mason traps be prohibited.

The motion was carried—in other words, the recommendation of the Winnipeg delegates was adopted, with slight modification.

Garage Drains.

Consideration of the Winnipeg by-law relating to garage drains was then taken up. The committee from Winnipeg did not recommend anything in particular, but called special attention to gasoline. Mr. Smith read section 21 of the by-law: "The entire plumbing and drainage system of any premises shall be separate and independent of that of any other premises until each separate

house drain has passed outside the external walls of the premises it serves, provided that in the case of semi-detached houses, double houses, or terrace houses a separate and independent plumbing and drainage system shall be installed in and for each house." It was decided to add the following:—"Providing that the floor drain of any garage shall be made in a manner approved by the plumbing inspector."

In reply to Mr. Mathias, the president stated that there were a number of fittings on the market, but two new ones were being built. These were simply to catch the gasoline.

Mr. Adam said all they had to do was to put a running trap inside the basin, but Mr. Smith replied that where there were too many fittings in the fixture it fouled. A committee was appointed to go further into the matter.

Lavatory Floor Drains.

The question of whether floor drains of lavatories shall discharge over a catch basin trap or water supplied fixture then came up. Mr. Taylor raised an objection, saying that they would have to make provision to flush school drains out.

The chairman said that in cases where there were boys, it was the practice to flush it out with the hose. There would be no objection to connecting such a drain with a flush.

Mr. Beaton said in Chicago they simply pitched the floor to the urinals, which were the ordinary type, with a flushing periodically.

Mr. Wharton wanted to know how they applied it to a ladies' lavatory. They had read of ladies' lavatories that were not flushed at all.

Mr. Beaton replied that it was not taken into consideration in girls' toilet rooms.

Kitchen Floor Drains.

The president drew attention to the fact that kitchens in large hotels never used a drain, but were gone over with a mop.

Eventually the recommendation carried. The approved section now reads as follows:—"Every fixture, or drain inlet, shall be separately and effectually trapped by a water sealing trap, placed as near as possible to the outlet of the fixture, and in no case shall a trap be more than two feet distant from such outlet; and all floor drains from lavatories or kitchens shall discharge over a catch basin trap or water supplied fixture."

The sub-section of the above was then taken up for discussion. The recommendation was that instead of "all traps shall have at least one and one-half-inch water seal, and shall be set true to their water level," that after the word "all" the words "fixture and floor drain" be added. This was adopted.

Water Test.

This question next came up for discussion. Winnipeg's by-law states: "The water test shall be applied by closing the lower end of the house drain and all other openings in the plumbing and drainage system, and by filling the pipes with water to the highest opening above the roof. Any part of such system may be tested separately, but in such case the head of water shall be at least five feet above all parts of the part so tested."

It was agreed that the water test would not be applied in extremely cold weather unless the premises are heated.

Standard Brass Pipes.

Mr. Bulloch, Edmonton, suggested that the matter of standardization of brass pipes and fittings be laid over until next year. Mr. Taylor, Saskatoon, objected, stating that it was a matter of great importance, and should be proceeded with. The matter was left over until the afternoon.

Cast Iron Fittings.

The committee appointed to report on the standardization of cast iron fittings and pipe recommended six, somewhat after those suggested by William McFarlane in a paper published in April 15 issue of Sanitary Engineer. Slight alterations were made to enable the fittings to be more easily manufactured. Spigot ends of branches were reduced to 5 inches instead of 6 inches, as suggested by Mr. McFarlane. This report was adopted, and it was decided to name the new fitting Samo, to distinguish it from those already in use. The name is composed of the initial letters of four provinces.

Sizes of Pipes.

The committee dealing with the sizes of soil, waste and vent pipes reported, through Mr. Huntbach, chairman, that they were unable to come to a decision in the time available, and recommended that the committee be kept in session until next convention, and bring in their report then. After some discussion, this recommendation was agreed upon.

WEDNESDAY AFTERNOON SESSION.

The recommendation of sub-committees were received.—Re drinking fountain. It was decided where only one fixture, the waste to be discharged into catch basin trap or open water fixture, and where more than one, each to be separate trapped and vent extended to roof.

Re Bar Fixtures.—Waste pipe from bar fixtures to be discharged into catch basin trap or open water supply fixture, each fixture separately trapped, and vent extended to roof.

Garage Drains.—It was decided to accept the recommendation of Winnipeg delegation, as quoted above.

Brass Goods.

The recommendation of the Winnipeg committee on the standardization of brass goods was then taken up clause by clause.

Clause 1.—All brass pipe used for soil, waste and vent pipes shall be thoroughly annealed, seamless drawn tubing having not less than the outside diameter, weight and thickness and gauge set forth in the following table:—

Adopted.

Clause 2.—All brass pipe used for outlets from fixtures, overflow pipes or

shall be at least one and a half times the thickness of the wall of fittings.

Adopted.

Clause 5.—All connections between brass pipes and iron pipes shall be made by a brass threaded bushing with a standard iron pipe thread outside and a standard brass thread inside, and all brass fittings and traps shall have legibly stamped on a conspicuous place the name or trade mark of the maker thereof.

Adopted.

Clause 6.—All brass water supply pipes shall be of iron pipe gauge and all threaded connections on such pipes shall be equal to iron pipe threads for same size of pipes and shall be tapered. In no case shall slip joints be made on water supply pipes. The diameters and weights per lineal foot of all brass tubing used for this purpose shall be not less than is set forth in the following table:—

Diameter.	Pounds per lineal foot.
$\frac{3}{8}$ inch	.62 pounds
$\frac{1}{2}$ "	.90 "
$\frac{3}{4}$ "	1.25 "
1 "	1.70 "
$1\frac{1}{4}$ "	2.5 "
$1\frac{1}{2}$ "	3. "
2 "	4. "
$2\frac{1}{2}$ "	5.75 "

Outside diameter of pipe.	Weight per lineal foot.	Thickness in inches.	British Imp. Wire Gauge.	Brown & Sharp Gauge
$1\frac{1}{4}$ inches	0.88 pounds	1-16 inch	16	14
$1\frac{1}{2}$ "	1.06 "	1-16 "	16	14
2 "	1.54 "	1-16 "	16	14
$2\frac{1}{2}$ "	2.82 "	7-64 "	12	10
3 "	3.41 "	7-64 "	12	10
4 "	5.74 "	1-8 "	10	8
5 "	7.22 "	1-8 "	10	8
6 "	8.71 "	1-8 "	10	8

flush pipes, or any part of a waste pipe on the local side of any trap shall be not less than 16 British Imperial wire gauge or 14 Brown & Sharp gauge, and all tees, couplings and fittings on such pipes and traps shall be of heavy cast brass, with iron pipe or standard brass threads.

Adopted.

Clause 3.—Brass pipe fittings with screw joint connections shall have not less than the following number of threads per inch and depth of bite:—

Size of pipe.	Number of threads per inch.	Depth of bite.
$1\frac{1}{4}$ inch to 2 inch	20	$\frac{1}{2}$ inch
$2\frac{1}{2}$ inch to 3 inch	12	$\frac{3}{4}$ "
4 inch to 6 inch	12	1 "

Adopted.

Clause 4.—Brass drainage fittings and traps shall be recessed, and of first quality cast brass, having a smooth interior and thickness in their walls of not less than twice the tabular thickness given in the table of brass pipe sizes. The recessed parts or sockets

tanks shall be provided with compression stop cocks and all compression stop cocks shall have a packing box.

All brass goods must be approved by the plumbing inspector.

It was moved by Mr. Nash, seconded by Mr. Fletcher, that this clause be struck out. Carried.

Examination of Plumbers.

The recommendations of both Winnipeg and Saskatoon were read to the meeting by the secretary, and after a lengthy discussion, taken part in by most of those present, it was moved by Mr. Swain and seconded by Mr. Robertson, that the resolution of the Winnipeg branch be adopted, with the exception of the last clause.

Readers may see this recommendation by referring to May 15 issue of Sanitary Engineer, page 17, col. 3. The last clause, which was struck out, reads: "That each examination shall consist of—for master plumbers not desiring to have a license to work with the tools, a theoretical examination—for master plumbers desiring to have a license to work with the tools or for journeymen plumbers: a theoretical and practical examination."

Mr. Adam moved and Mr. Gothard seconded, that the above clause dealing with examination be adopted, with certain lines deleted. The clause as adopted reads: "That each examination shall consist of, for plumbers and journeymen plumbers, a theoretical and practical examination."

Draft a By-Law.

On the motion of Mr. Knechtel, seconded by Mr. Campbell, it was decided to appoint a legislative committee to draft a by-law covering the work done at the last two conventions, and to consider all the suggestions submitted to them, and to report at the next convention.

The vice-presidents and directors were appointed a committee.

The Winnipeg resolution re technical education as published in our last issue, was adopted.

Clean-outs.

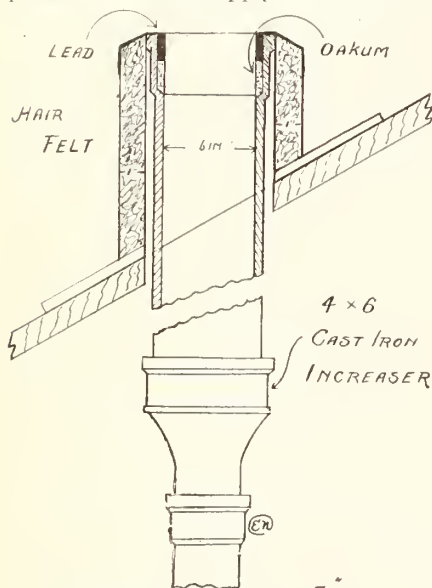
A matter relating to clean-outs which was brought up at the morning session, was now dealt with. Winnipeg delegation suggested that the section dealing with clean-outs provided at the foot of each stack placed so as to be easily accessible, be changed to read: "such clean-outs in all cases shall be formed by Y-fittings and $\frac{1}{8}$ bonds, or by special fittings."

Also, that Section 28, which states that "all covers on clean-outs fitted on cast iron pipes shall be made of brass, not less than etc.," the words "fitted on cast iron pipes" be deleted, and that where the section says that a nut shall be screwed on, and made air-tight by a suitable gasket, that this be changed to read, "by the use of graphite or graphite gasket."

These suggestions now came up for consideration. Messrs. Fletcher and Huntbach moved that the matter be referred to a research committee in the first place, to have designs made and samples sent to representatives in each city, and then pass them on to the legislative committee. Carried.

The main part of the business being ended, the meeting was thrown open for general discussion. Messrs. Nash and Gothard made an important suggestion, more of which will be heard in the near future, as the suggestion is already taking shape in several cities. They suggested that efforts be made to have the plumbing department separated entirely from all other departments in municipal work. In many cases this department is now under the supervision of the city engineer.

It was decided to pay William McFarlane, secretary, an honorarium of \$50 over and above his expenses. Mr. Fletcher moved that votes of thanks be sent to the City of Edmonton, the Edmonton master and journeymen plumbers, the Industrial Association, plumbing inspectors, and local supply houses. It was



DETAIL OF ROOF CAP A
AS REQUIRED IN WINNIPEG.
Shown, so as to compare it with the
one recommended by Saskatoon,
at the recent convention.

also suggested that the minutes of the convention be printed, and sent to members and municipalities.

EXPLOSIONS IN SEWERS AND CONDUITS.

As usual, some of the best things were left until the last. E. P. Fletcher, plumbing inspector of Calgary, was called upon to deliver an address upon the above subject, at the eleventh hour. The subject is considered an important one in the West, where automobiles are becoming very common, and where these have not been taken much into account. The paper will be read with interest by sanitary engineers all over the West.

The cause of various explosions in sewers is often published in the newspapers as "Sewer Gas Explosions." but while the explosions may take place in a sewer manhole, the cause is generally from illuminating gas, gasoline, calcium carbide and hydrocarbon oil (a by-product of Pintsch gas.)

The prevention of these explosive gases, liquids or gas generating substances entering our sewers or conduits and overcoming the difficulty if they do enter, is a subject which we should consider in the interest of public health and safety.

Illuminating gas (natural or artificial) enters the sewers from broken mains or leaky joints, and when mixed in the proper proportions with air forms a highly explosive mixture.

Gasoline is conveyed to the sewers in large quantities from public or private garages, and it is said that one volume of gasoline produces 141 volumes of vapor, and one part of this vapor to 62½ parts of air furnishes a mixture which is highly explosive and although it takes an open flame to ignite it, this is often furnished by sparks from electrical apparatus, and from fire engines passing over manholes. While illuminating gases are lighter than air, gasoline vapor is heavier, therefore the use of ventilated manhole covers will not always allow them to escape. Calcium carbide, used to a large extent in garages for generating light, is very often thrown into the floor waste opening, and when in contact with water, generates acetylene gas, which is an intense explosive, as was demonstrated at Malcom a few days ago, and as this gas is auto-combustible, in many cases it is lighted by its own heat generated in the process of being transformed to gas.

Hydrocarbon oil under low temperatures forms crystals which are soluble in water, forming an explosive gas.

There have been a large number of explosions from these gases, some of which caused loss of life, and others the destruction of sewers. Expensive fires in which the insulation of wires and cables in conduits were burned before they could be extinguished are also of frequent occurrence.

The source of these troubles is largely from the following:—

- Private and public garages.
- Gas mains and connections.
- Dry-cleaning establishments.
- Lithographing plants.
- Oil storage warehouses.

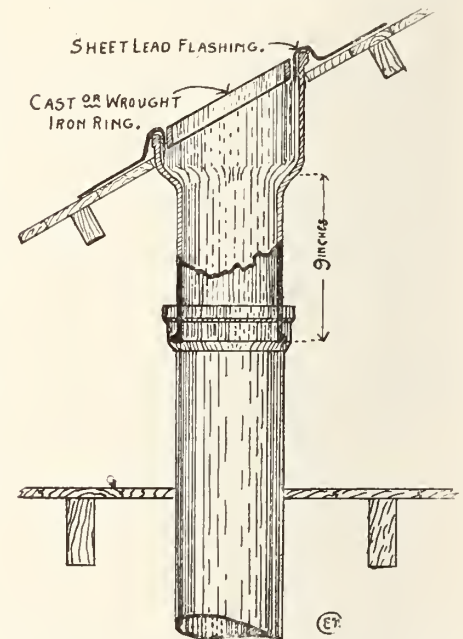
The two difficulties arising from these places must be met, in my opinion, first, by preventing as far as possible, the discharge of these volatile inflammable oils into the sewers, and secondly, so constructing the sewerage system to allow the vapors to escape.

In the first place, ordinances should be designed to protect sewers from combustibles. The Washington ordinance, which is as follows, seems to cover same to a certain extent: "No person shall make or maintain any connection with any public sewer or appurtenances thereof, whereby there may be conveyed into the same any hot, suffocating, corrosive, inflammable or explosive liquid, gas

vapor, substance or material of any kind, and no person shall cause to enter or flow into any public sewer or appurtenance thereof, any hot, corrosive, suffocating inflammable or explosive liquid, gas vapor, substance or material of any kind, provided, that the provisions of this paragraph shall not apply to water from ordinary hot water boilers of residences."

There are also rules for the installation of garage traps and oil separators, but it would be difficult to compel private garages to install expensive traps and separators, but for the large establishments it would almost seem necessary.

Secondly, the ventilation of sewers and



Showing new roof terminal in actual
practice, proposed by the Saskatoon
Association at their recent
convention.

conduits by ventilate manhole covers and by untrapped house connections seems to be the most effective method of overcoming the dangerous explosions which are liable to occur as there are bound to be some gases passing through, and you are probably all aware that there will be numerous violation of any ordinance without being able to detect them.

Oil entering the sewer is also an expensive factor in maintenance, as it adheres to the walls of the pipe, and is very difficult to remove, as it will not break up like ordinary grease from kitchen waste.

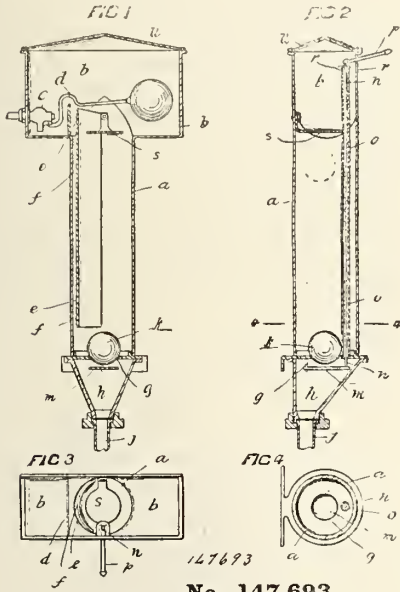
The Calgary system of services by the omission of the house trap are ventilated by all house connections and through manhole covers, and we have not as yet met with any explosions, but are experiencing some difficulty with the heavier oils. Those cities continuing the use of trap on house connections, and who have or are about to lay gas mains through the streets are liable, in my opinion to have the same experience.

NEW CANADIAN PATENTS

No. 147,693.

Patrick McIlveney, assignor, Davenport, William B. McIlveney and James McIlveney, both of Wellington, each an assignee of one-third the interest, all in New Zealand.

Claim.—1. Water flushing apparatus consisting in a vertical cylinder, a horizontal extension upon the top of the cylinder and in communication therewith, a water supply pipe leading to



No. 147,693.

Water Closet Flushing Apparatus

such extension and governed by a ball cock situated within the extension, a discharge opening in the bottom of the cylinder, a float valve loose in the cylinder and adapted to fit into the discharge opening, a plate valve arranged at a short distance below the discharge opening and means consisting of a pivoted lever for raising and lowering such valve plate, substantially as specified.

2. In water flushing apparatus, a vertical cylinder having means for filling it with water and a discharge opening near its bottom end formed in a partition extending across the cylinder, a float valve placed loosely in the opening, a rod extending vertically down through the cylinder and adapted to fit in to close the discharge cistern to beneath the partition, a plate on the lower end of such rod underlying the float valve and lever upon the upper end of the rod extending to without the cistern, by means of which the rod may be raised or lowered substantially as and for the purposes herein specified.

3. In water flushing apparatus, a vertical cylinder, a cistern extending later-

ally across the top of the cylinder, a chamber at one end of the cistern formed by a transverse division plate extending through portion of the height of the cistern, a ball cock situated in such chamber and connected with a source of water supply, a passage leading from the outside of such division plate down the inside of the cylinder to near the bottom thereof, a discharge opening in the bottom of the cylinder, a float valve loose in the cylinder and adapted to fit into the discharge opening and means whereby such float valve may be raised from its seat, substantially as and for the purposes specified.

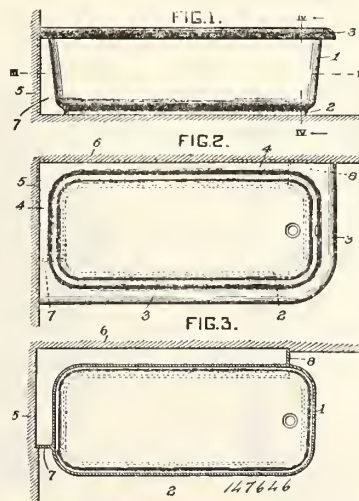
No. 147,646.

John C. Reed, Pittsburgh, Pennsylvania, U.S.A.

Claim.—1. As an article of manufacture, an enameled cast metal bath tub consisting of a body portion and laterally extending wings integrally formed therewith and adapted when the tub is installed adjacent to a wall to form a connecting partition between such wall and the said tub.

2. As an article of manufacture, an enameled cast metal bath tub consisting of a body portion having integrally formed therewith a depending supporting rib and laterally extending wings adapted when the tub is installed to form a closure between the tub and an adjacent wall.

3. As an article of manufacture, an enameled cast metal bath tub of an integral structure throughout and consisting of a body portion, a depending supporting rib, a top rim, and a pair of vertically disposed wings extending from



No. 147,646. Bath Tub.

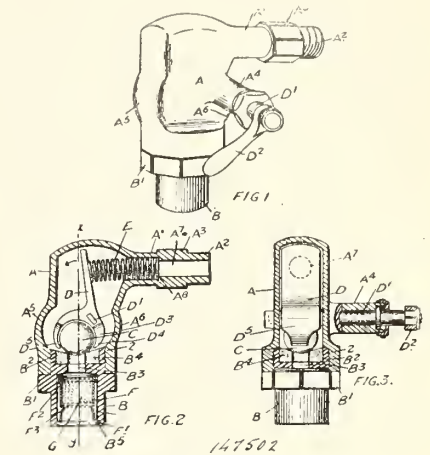
the under side of the said rim to the plane of the supporting rib, the said rim between the two said wings having a horizontally disposed ledge.

* * *

No. 147,502.

William Alexander Fraser, Georgetown, Ontario, Canada.

Claim.—1. In a faucet or the like, the combination with the body of the faucet provided with a spout portion having a central orifice in the lower portion there-



No. 147,502. Faucet.

of, of a lesser ball valve having its seat normally on the edge of the orifice and a shifting lever located within the faucet and having a rear tail located laterally behind and adjacent to the ball and an upwardly extending portion, the end of which is substantially opposite the orifice leading to the body of the faucet, and a stem extending through the body of the faucet into the lever and provided with an operating handle, as and for the purpose specified.

2. In a faucet or the like, the combination with the body of the faucet provided with a spout portion having a central orifice in the lower portion thereof, of a loose ball valve having its seat normally on the edge of the orifice and a shifting lever located within the faucet and having a rear tail located laterally behind and adjacent to the ball and an upwardly extending portion, the end of which is substantially opposite the orifice leading to the body of the faucet, and a stem extending through the body of the faucet into the lever and provided with an operating handle, and a spiral spring located in the body of the faucet between the upper end of the interior lever and the seat surrounding the orifice through which the water

passes into the body of the faucet, as and for the purpose specified.

3. In a faucet or the like, the combination with the body of the faucet having a spout portion provided with a central orifice, of a ball valve having its seat normally on the edge of the orifice and a shifting lever having a rear tail and upwardly extending portion, a stem extending into the lever intermediate of its length and laterally through the faucet and a spiral spring extending between the upper end of the lever and a seat surrounding the orifice for the ingress of the water into the faucet, as and for the purpose specified.

4. In a faucet or the like, the combination with the body of the faucet having a spout portion provided with a central orifice, of a ball valve having its seat normally on the edge of the orifice, and a shifting lever provided with rear and forwardly extending tails, and means for operating the shifting lever, as and for the purpose specified.

5. In a faucet or the like, the combination with the body of the faucet having a spout portion provided with a central orifice of a ball valve having its seat normally on the edge of the orifice, and a shifting lever provided with rear and forwardly extending tails and a stem extending into the shifting lever intermediate of its length, and means for turning the stem located outside of the faucet, as and for the purpose specified.

* * *

No. 150,461.

Alfred Cotton, Newark, New Jersey, U.S.A., 16th September, 1913; 6 years. Filed 16th July, 1913. Receipt No. 226,831.

Claim.—1. An air regulator for a furnace comprising a controlling reservoir of fixed capacity, means for supplying steam to said reservoir, means for permitting steam to exhaust therefrom, a pipe leading steam to the furnace fire-box, a valve in said pipe, means whereby said valve will be normally held seated

or closed by the steam pressure in said pipe, means whereby steam under pressure from the controlling reservoir will unseat or open said valve, in combination with a fire door, a valve controlling communication from the steam supply to the controlling reservoir, means operatively connecting the fire door to said valve whereby said valve will be opened when the fire door is opened and will be closed when the fire door is closed.

2. An air regulator for a furnace comprising a controlling reservoir of fluid capacity, means to control the supply of steam to the controlling reservoir, a steam jet blower, a valve controlling the supply of steam to said jet blower, means whereby said valve will be normally held closed by the steam pressure, means operated by pressure from the controlling reservoir to open said valve and permit steam to flow to jet blower when the pressure in said controlling reservoir is substantially equal to the pressure holding the said valve closed, and means to permit steam to flow from the controlling reservoir, whereby the steam supply to the jet blower will be cut off when the pressure in the controlling reservoir is sufficiently reduced.

3. An air regulator for a furnace comprising a controlling reservoir, means for intermittently supplying steam to the controlling reservoir, a steam jet blower, a valve controlling the supply of steam to said jet blower, means whereby said valve will be normally held closed by the steam pressure, means operated by pressure from the controlling reservoir to open said valve and permit steam to flow from the controlling reservoir, whereby the steam supply to the jet blower will be cut off when the pressure in the controlling reservoir is sufficiently reduced.

* * *

No. 150,846.

Earl G. Watrous, Chicago, Illinois, U.S.A., 30th September, 1913; 6 years. Filed 5th March, 1913. Receipt No. 221,354.

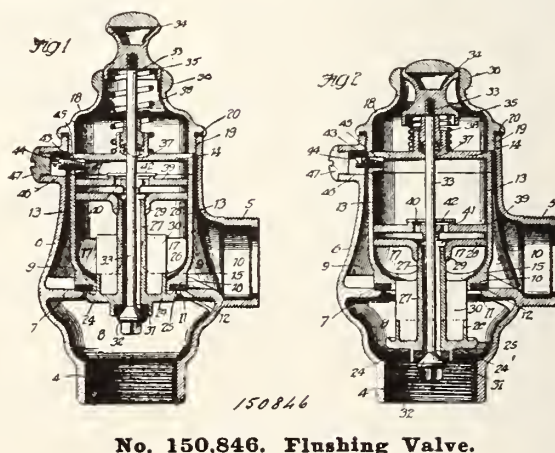
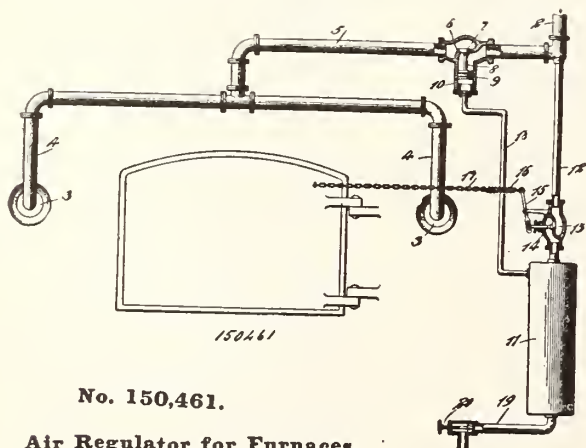
Claim.—1. In a flushing valve, the

combination of a cylinder, a piston therein, a main valve connected to said piston, a supplemental valve controlling the passage leading from the pressure supply through the main valve to the cylinder, a supplemental piston located in the same cylinder as the main piston and connected to the supplemental valve, and means for manually opening the supplemental valve, substantially as described.

2. In a flushing valve, the combination of a cylinder, a piston therein, a main valve having a tubular valve stem connecting it with said piston, a supplemental valve controlling a passage leading from the inlet side of the main valve through said valve and its tubular stem to the cylinder and having a stem extending longitudinally through the same and through the cylinder to the upper side thereof, and a supplemental piston fast upon the supplemental valve stem within the cylinder, substantially as described.

3. In a flushing valve, the combination of a cylinder, a piston therein, a main valve having a tubular stem connecting it with said piston, a supplemental valve having a valve stem extending longitudinally through the main valve and its tubular stem and the cylinder to the upper side of the latter and operating to control a passage leading from the pressure supply through the main valve and its tubular stem to the cylinder, a supplemental piston fast upon the supplemental valve stem within the cylinder, a push button upon the upper end of the supplemental valve stem for depressing the latter to open the supplemental valve, and a spring operating to close said supplemental valve, substantially as described.

4. In a flushing valve, the combination of a cylinder, a piston therein, a main valve connected to said piston, a supplemental valve controlling a passage leading from the pressure supply through the main valve to the cylinder, a supplemental valve within the cylinder, a check valve controlling passages through said



supplemental piston, and means for manually opening the supplemental valve, substantially as described.

5. In a flushing valve, the combination of a cylinder, a piston therein, a main valve having a tubular valve stem connecting it with said piston, a supplemental valve controlling a passage leading from the pressure supply through the main valve and its tubular stem to the cylinder and having a stem extending longitudinally through the same and through the cylinder to the upper side of the latter, a supplemental piston fast upon the supplemental valve stem within the cylinder, and a check valve controlling passages through said supplemental piston, substantially as described.

6. In a flushing valve, the combination of the cylinder 13, the piston 28 therein, the main valve 24 having the tubular stem connected at its upper end with the piston 28, the supplemental valve 32 controlling the passage of water from the inlet to the upper side of the piston 28 and having a stem 33 extending longitudinally through the main valve and its tubular stem and the cylinder 13 to the

passage when it is at one end of its movement and to occupy a position intermediate between said passages when it is at the other end of its movement, and an automatic plug operating device adapted to move said plug from said intermediate position to the first-named end of its movement, said device being removable independently of said plug and the latter being in such case free to be moved by water pressure to the opposite side of said chamber and close said outlet.

2. In a device of the class described, the combination of a valve chamber having an inlet and an outlet respectively at the bottom and top thereof, a plug reciprocating in said chamber and adapted to seat against either said inlet or outlet, and an automatically operated device which actuates said plug and holds it more or less depressed from a mid-position downward depending on certain conditions of the water outside the valve, said automatic device being removable independently of said plug whereby the latter is free to close said outlet and is caused to do so by the pressure of the water from below.

3. In a device of the class described, the combination of a three casing elements, to wit, a base member, an inner casing member having a screw-threaded connection therewith, the opposite faces of said base member and inner casing member being hollowed to form an inner valve chamber, said valve chamber having an inlet through the base member, and having an outlet through said inner casing member, and an outer casing member secured over said inner casing member in a manner permitting its release therefrom, a valve stem extending into said outer casing member, and an automatic device adapted to actuate said valve stem.

* * *

No. 150,664.

John P. Schaffer, Pittsburgh, Pennsylvania, U.S.A., 23rd September, 1913; 6 years. Filed 11th July, 1913. Receipt No. 226,701.

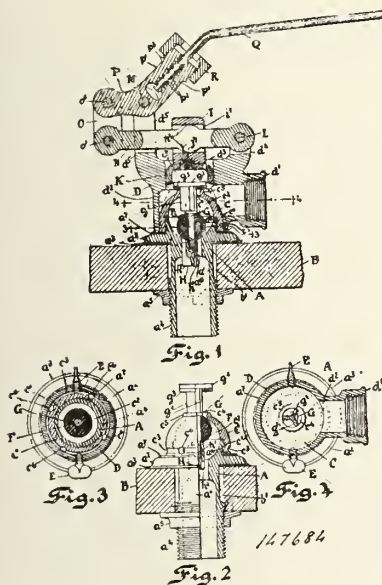
Claim.—1. In a boiler for heating water, the combination with the hollow body for the water and having the fuel chamber therein, of a vertical tubular flue within the hollow sides of said body and within the water therein, a horizontal flue in the upper portion of said body connecting said vertical flue at its upper end with the smoke box, and a fluid supply pipe connected to said vertical flue at its upper end with the smoke box, and a fluid supply pipe connected to said

vertical flue for supplying fuel to the same to heat the water in said body.

2. In a boiler for heating water, the combination with the hollow boiler body for the water and having the fuel chamber therein, of a vertical tubular flue within the hollow sides of said body and within the water therein, a horizontal flue in the upper portion of said body connecting said vertical flue at its upper end with the smoke box, a fluid supply pipe connected to said vertical flue for supplying fuel to same to heat the water in said body, and a burner within said vertical flue and above said pipe.

3. In a boiler for heating water, the combination with the hollow boiler body for the water and having the fuel chamber therein, of a vertical tubular flue within the hollow sides of said body and within the water therein, a horizontal flue in the upper portion of said body and connected to said vertical flue by an inwardly extending portion on said vertical flue, and a fluid supply pipe connected to said vertical flue for supplying fuel to the same to heat the water in said body.

4. In a boiler for heating water, the combination with the hollow boiler body for the water and having the fuel chamber therein, of a vertical tubular flue within the hollow sides of said body



No. 147,684. Ball Cock.

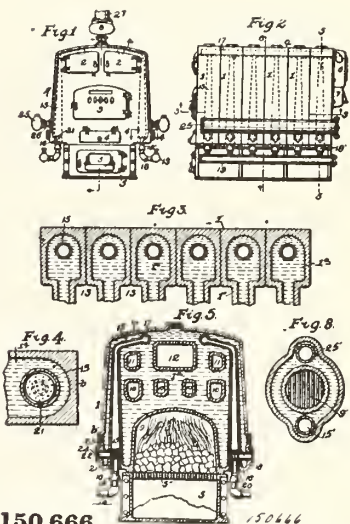
upper side of the latter, and the supplemental piston 39 fast upon the valve stem 33 above the main piston 28, substantially as described.

* * *

No. 147,684.

Henry W. Theis, Milwaukee, Wisconsin, U.S.A.

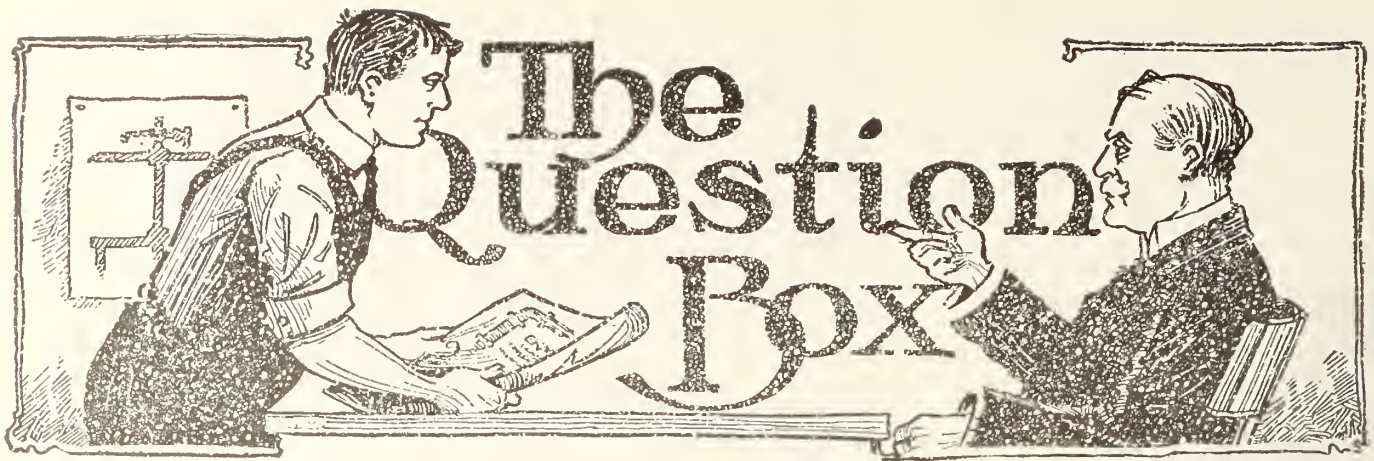
Claim.—1. In a device of the class described, a valve chamber having an inlet and an outlet passage at opposite sides thereof, a reciprocating plug in said chamber adapted to close the inlet



150,666.

Hot Water and Steam Boiler.

and within the water therein, a horizontal flue in the upper portion of said body and connected to said vertical flue by an inwardly extending portion on said vertical flue, a fluid supply pipe connected to said vertical flue for supplying fuel to the same to heat the water in said body, and a burner within said vertical flue and above said pipe.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

WHY NOT CONNECT BATH AND LAVATORY WASTE TO W.C. LEAD BEND?

Editor Sanitary Engineer:—In your April 1st issue of Sanitary Engineer you publish an article entitled, "A Discussion on Simplified Plumbing." I notice you state that "in no case should the waste from other fixtures be allowed to connect into the lead bend for the closet."

Would you kindly explain in your next issue your main objections to making this connection? S. J. C.

Replying to "S. J. C.," we may say there are quite a number of reasons why lavatory and bath waste pipes should not connect to the lead bend. For instance, it was this connecting of the waste pipes mentioned that made it necessary for the traps of the lavatory and bath to be back-vented, because of the syphonic action set up when the w.c. is flushed. Then, again, there is too much expansion and contraction takes place at the lead bend when hot water is run from the lavatory and bath.

Then, again, it cannot be disputed that every waste pipe should have its own separate connection to the main vertical stack whenever possible, and when such connections are made they are independent of each other.

Further, it has been customary to place w.c.'s in the bathroom, but to-day changes are taking place, and it is found advisable to place the w.c. in a separate compartment, with a door leading from bathroom to w.c., as well as a separate door to the w.c.

Such a plan is much more convenient, because it is often found that the w.c. has been required when at the same instant the lavatory has been in use; but the custom must give place to convenience as well as the old method of wiping the lavatory and into the lead bend.—Editor.

HOW CAN I FIX A PUMP TO DO THIS WORK?

Editor, Sanitary Engineer.—I have a pump to install at a summer cottage which is not near any power of any kind. Gasoline is out of the question, so the outfit must be simply a hand-driven pump. I herewith inclose a sketch showing what I am up against. The water

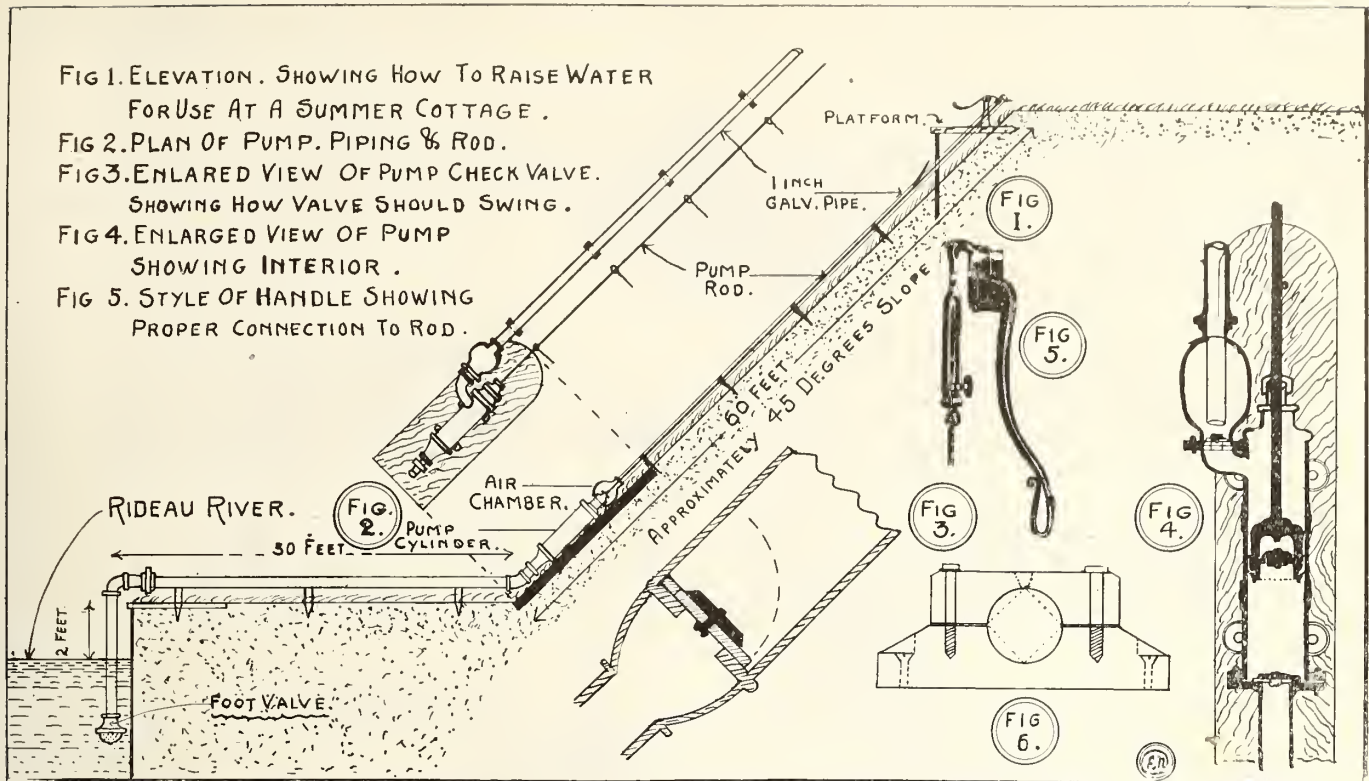
NOTICE TO READERS.

We have quite a number of readers who send in questions to be answered but fail to give us their address. We would like to receive addresses as a guarantee of good faith, also to enable us to answer their question privately. For instance, we had several questions which showed the answer was urgent, because of its very nature, and in such a case the questioner has had to wait in many cases over two weeks and more, and often a question is such that it requires more particulars. Therefore we respectfully ask our readers to give us their full address, which is not necessarily for publication.—Editor.

is to be taken from the Rideau River, which is situated as shown in the sketch. It will be seen that from the lower part of the ground the water is about 2 feet down and never varies more than a few inches. The lower level of ground is about 30 feet and perfectly level. The slope is at an angle of about 45 degrees and measures 60 feet from the higher level. The cottage is about 50 feet away from the edge. Now, what I have to do if possible is raise water to water this 50 feet of garden in front and to fill a tank which is to be placed

on the top of the cottage. This will be about 9 feet high. Can this be done? If so, please give all particulars, such as kind of pump, size of pipes required, and method to adopt. An early reply in Sanitary Engineer will oblige.—A. C. O.

In answer to A. C. O., we ask him to refer to the sketches given. Fig. 1 shows the layout of the ground, water, and pump when in position. First, a strong pump will be necessary, the joints will require to be well made from end to end, the piece of pipe which is extended vertically into the water must be $1\frac{1}{4}$ in. galvanized and not less than 4 feet long from foot valve to elbow—a nipple about a foot long should be used and then a union. By connecting in that way it will be easy to take this piece out of the water in case anything gets between the seat and leather of the foot valve. Next run the 30 feet or so of $1\frac{1}{4}$ galvanized pipe. Of course, both the sloped and level ground must be straightened and supports prepared, so that piping will be laid straight. Next lay the pump in position as shown in Figs. 1 and 2. The most important point is to see that proper supports for the pump rod are used. These must be in perfect alignment to avoid all unnecessary friction. This may be effected by driving wooden spikes into the ground about 3×2 inches and then making a block in two pieces as shown in Fig. 6. A hole may be bored in the top for grease. The blocks should not be less than 2 inches wide so as to give that amount of bearing for the pump rod. The next important matter is that of the connection at the upper end of the rod. This must be as designed and shown in Fig. 5. The handle can be turned to any position, as the construction is one which will allow of this. These pumps can be bought complete on a board from any manufacturer, and



all that is necessary is to lengthen up the rod. In Fig. 1 a platform is shown. This is to allow the connection to be made between a hose and the pipe, and may be built with the pipes running through or a little to one side. The pipe running up the slope must be 1 in. galvanized. Fig. 3 shows an enlarged view of the valve which is in the bottom of the cylinder of the pump, and the position in which it should be placed so as to allow the proper opening of same as well as closing. Fig. 4 shows the interior of pump, with details of the working parts, which for this purpose will give very good results. Regarding the filling of a tank at the top of the cottage, this depends upon the amount of muscle put into the task of pumping. If an iron pipe is run from the pump to the tank it will require more strength than if a good-sized hose, say $\frac{3}{4}$ inch, be used, and placed in such a way as to run over the edge of tank, seeing that in using a hose there would be no quick turns, as would be the case if an iron pipe is used.

The size of the rod would need to be not less than $\frac{1}{2}$ inch, or it could be made of $\frac{1}{2}$ -inch iron pipe if necessary, though we would recommend the $\frac{1}{2}$ -inch solid iron rod. This rod could also be made of $1\frac{1}{2}$ -inch square maple or oak and set in blocks as shown in Fig. 6, except that the hole in these blocks should be made as shown by the dotted lines. Moreover, if wooden rods are used the blocks and supports would only require to be at intervals of 5 feet centre to centre, whereas if iron is used they

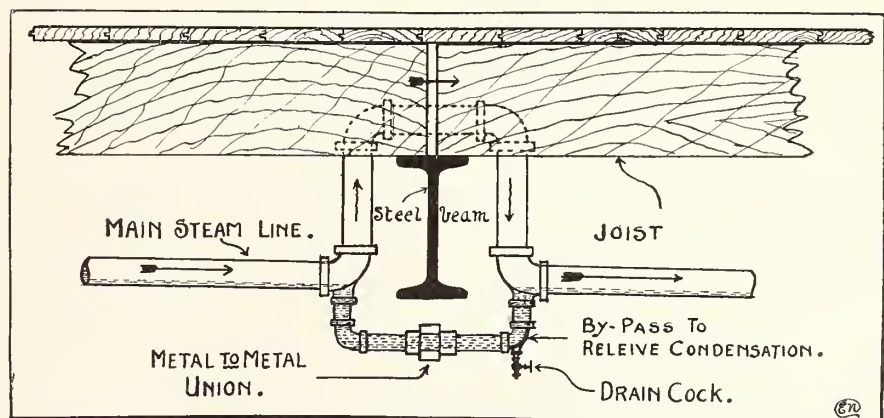
would require to be placed every $2\frac{1}{2}$ or 3 feet. For lubricating the rod use a good mica grease, such as is used for axles, etc. This will be the best for either kind of rods. Another thing to bear in mind so as to avoid—or shall we say minimize?—friction at the portions of the rods, if iron ones are used, is to file or rub with emerycloth the portions of the rod which work in the blocks. Finally, when constructing this apparatus every care should be taken to see that it can be taken apart in the fall and stored away. A little thought is the best advice we can give in this matter.—Editor.

HOW MUST THIS MAIN BE RUN?

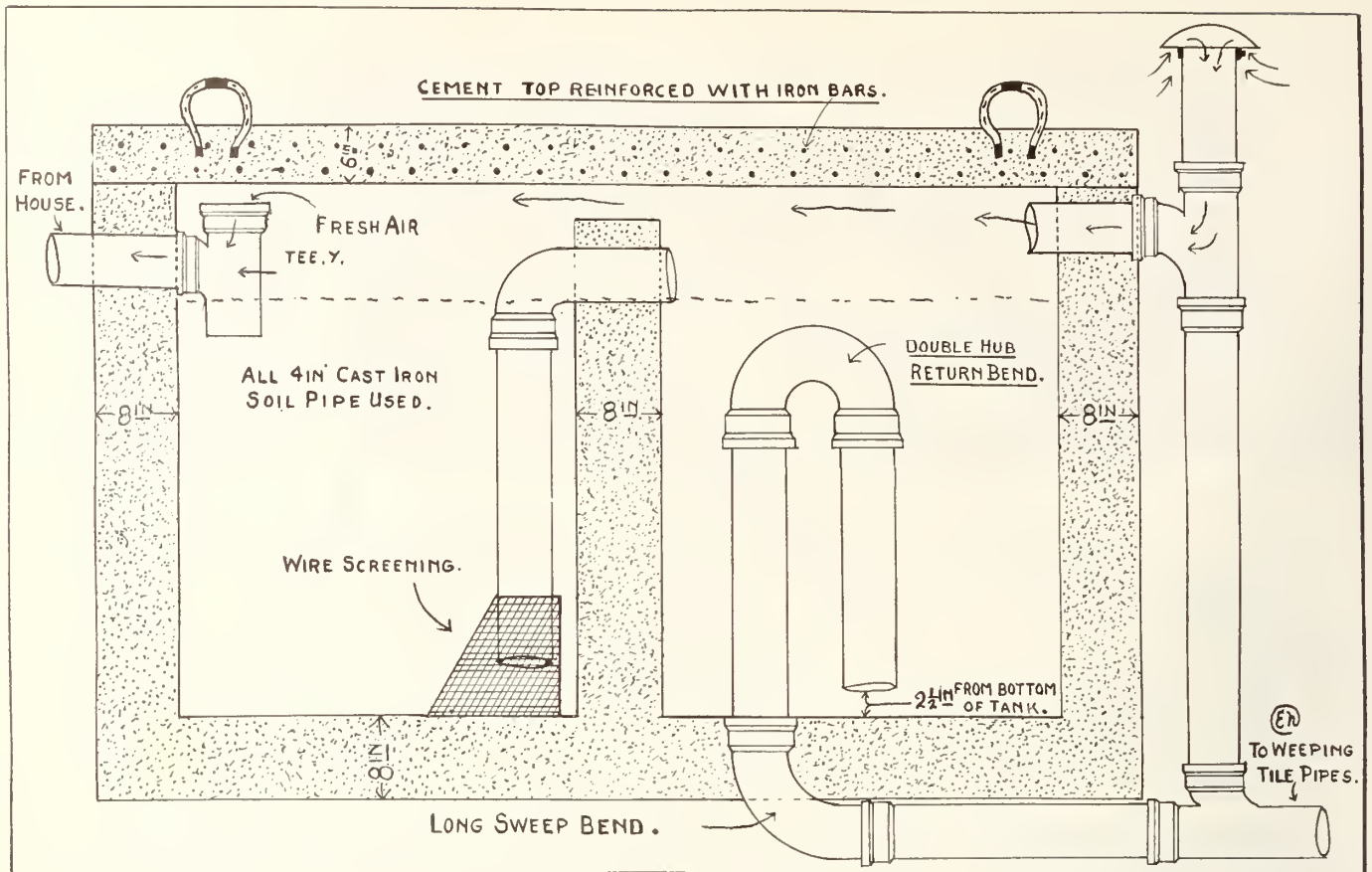
Editor Sanitary Engineer—I am putting up a one-pipe steam job in a building, and close to the boiler is a door. I

want to raise the main high enough to miss the door, but in so doing I get into trouble with a steel I-beam. The architect will not allow the beam to be drilled, and I would like to know if you can show me a way out of the trouble by giving a reply in your next issue of Sanitary Engineer. Steamfitter.

In replying to "Steamfitter," we are submitting sketch which will show him how to overcome his trouble, and may say if it will help him any by placing the main as high as possible at the boiler the job will be all the better, and will allow the return more height when it reaches the boiler. Many a one-pipe job has been installed too low, and have had a very poor appearance on account of such conditions. Another item which should receive some thought when making such connection is that none but metal to metal unions should be used, because this by-pass will always be full



Showing how to run a steam main where I beam is in the way.



Sketch of septic tank sent in by C. F. G.

of water, which varies in temperature according to the amount of condensation taking place and passing through. A common union is apt to give out any moment, and no doubt that moment would be when the system is in most need.—Editor.



EXPLANATION RE SEPTIC TANK.

Editor Sanitary Engineer.—I would like to ask a few questions in connection with the letter and sketch from C. F. G. in your issue of April 15.

First.

From the dotted line in the sketch, which is apparently intended to show the water line. I take it that the contents of the second tank are supposed to be syphoned out when the tank gets full. I cannot understand, however, how this result will be accomplished without placing a trap below the tank where the long sweep bend is shown. To my mind, with the syphon installed as shown, the water, as it enters the tank, would merely dribble over the return bend without starting syphonic action, unless sufficient water were discharged at once to fill the pipe. This condition would rarely occur in ordinary use.

Second.

While speaking of septic tanks, we would like to ask the editor or other

readers how they would dispose of sewage by septic tank where the ground in all directions from the house is practically level and of such a nature that ground water is struck at a depth of 6 or 7 feet below the surface. The fact of the ground being level precludes the possibility of discharging the contents of the second tank throughout a system of field tile as is usual. Under these conditions, it is almost impossible to have the top of the septic tank less than three feet below the surface of the ground if you run any distance from the house.

We have installed one or two under such conditions and could not see any other way than to allow the second tank merely to overflow into a third tank or pit filled with stones or gravel.

If there is a better way, we would like to know of it. We might say that we have had no trouble with the ones we have installed. The ground is sand and quicksand with clay bottom.

T. A. C.

No doubt T. A. C. is right when stating that the liquid would simply dribble through the return bend as shown, and we hope C. F. G. will be able to explain whether syphonic action was expected of

this arrangement. we do not, think it could be, but rather that the fluid would be taken from the bottom. And the ground may have been of such a nature as would take care of sewage so discharged into it.

In our next issue we will give several suggestions how septic tanks should be placed under various conditions, we realize that under certain conditions it is a problem of no mean order to grapple with is the disposal of sewage, and no department is attracting the attention of sanitary engineers at the present day more than that of sewage disposal and with it the problem of water supply pollution.—Editor.



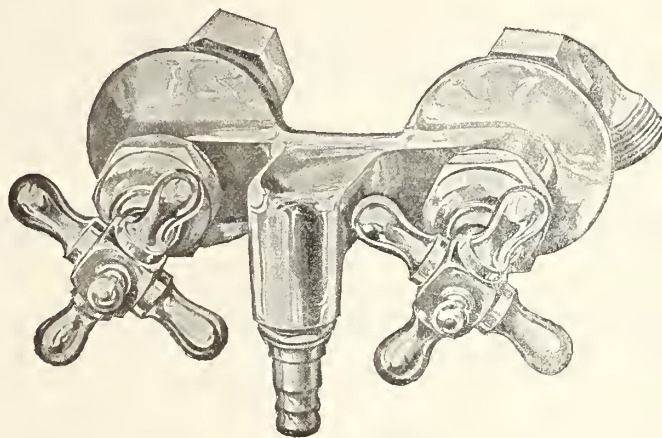
THAWING OUT A STACK.

Not very long ago I was called into a house to thaw out a soil pipe stack which had been placed on an outside wall. There was a steam radiator in the bathroom, so I took the inside out of the air vent and placed a small hose over the vent, took the w.c. bowl up and inserted the hose into the stack, which was frozen solid. In less than an hour I had the stack cleared.

R. F. H., Sask.



EMPIRE No. 2 MIDGET BATH-COCK



Look at it well; isn't it just what you have been waiting for?
A compact and well-designed compression bath cock.

The best of metal is used in its manufacture and the utmost care taken that all threads are made to standards.

Its design has beauty in every line and the nickel finish is perfection itself.

If your jobber does not stock it write us at once, you cannot afford to be without it.

EMPIRE MANUFACTURING CO., LIMITED
LONDON, CANADA

MANUFACTURERS OF AND DEALERS IN
PLUMBERS' AND STEAMFITTERS' SUPPLIES OF ALL KINDS

Plumbing and Heating Markets

MONTREAL, May 26. — While business is not as good as it might be, it is nevertheless improving somewhat, and if there is not as much new work to take care of as could be desired, there is a lot of repairing, which has kept many of the shops pretty busy all along. There is no doubt that the "Clean-up and Paint-up" campaign which has been carried on for the past month, and which culminated last week in six days of special clean-up effort, has been generally helpful. It proved beneficial for the city, and it has also helped many lines of trade, such as grocers, hardware and paint dealers, and last, but not least, the plumbers. Certainly, the extraordinary activity of the health inspectors was responsible for a lot of extra repair work being ordered, and in a number of the shops visited the report was given out that it had been "a mighty busy week." Plans are now being made to make the clean-up organization an all-the-year institution. May it be so.

Metal Markets.

Most of the metal markets have been very weak, and a dullness pervades the situation at the present time. Prices have not changed to any extent, but the tendency has been downwards.

Lead and Waste Pipe.

While there has been no change in prices since last report, the market may still be said to be unsettled. The demand has been only fair and the outlook is rather uninteresting. Solder has been moving better, probably due to the large amount of repair work.

Soil Pipe and Fittings.

On account of considerable building of residential properties in the suburban districts there has been a fairly good demand for soil pipe, and there seems to be no immediate indication of a falling off in this direction.

Black and Galvanized Iron Pipe.

The market continues quiet and the demand about the average. The talk of a month ago, of a new price list on certain lines, has not materialized, and quotations are unchanged. Pipe fittings are also unchanged under a fair demand.

Brass Goods.

Though it was thought there might be new prices on brass goods following the tariff changes, nothing has yet come to pass and conditions are about as last reported. Unless business brightens up considerably, it is not thought that the present quotations will be altered.

Enamelware.

The demand thus far has been mainly in the direction of repairs or replacing

worn out or damaged pieces. Manufacturers report that there is nothing exceptional to be said at present, but it is probable that with the completion of buildings now under way business will improve.

TORONTO, May 27.—Business has taken a decided tone for the better since last issue of Sanitary Engineer. There has been more building permits issued within the last month than was ever expected by the most optimistic business man, and quite a large number of buildings are well under way, while there is an enormous amount of ground being broken up for foundations. The most popular type of buildings being erected are for residential property of a moderately good class, ranging from \$2,500 to \$6,000. A good class of fixtures are more in demand, which proves to a certain extent that people are having their own homes built, rather than for a speculative purpose.

Enamelware.

No very great increase in demands is being experienced, though there is a little larger quantity of this line moving just now, which is being taken up by those who are doing reconstruction and remodelling of bathrooms, etc. Orders are being booked for future requirements. Prices remain the same as last reported.

Brass Goods.

No changes in prices are reported and there is slight increase in demands, with a feeling of optimism that it is only a matter of time when business will have recovered to its normal condition.

Black and Galvanized Iron Pipe and Fittings.

This commodity is still a little slow in demands and some mills are still running easy. However, as building operations reach nearer completion this line will take on a healthier tone. No changes in prices as yet is heard of.

Soil Pipe and Fittings.

The demand has taken on a much healthier tone since our last issue, and the outlook is even more optimistic than was at first expected it would be. In Winnipeg there is a movement on foot to have all soil pipe and fitting standardized, drawings of which were published recently in Sanitary Engineer.

Lead Pipe and Traps.

Discounts remain the same and there is no change in tone. In fact, the metal

market as a whole is a little easy, but it is expected it will take on a stronger tone as demands increase.

Tin and Solder.

Prices remain easy. There has, however, been a decrease of half a cent on tin. Solder reduced about a cent all round in proportion to the tin used in it.

Collections.

Very little can be said about collections. Some manufacturers and jobbers report them slow, while others report very fair. Ontario collections seem to be very good. British Columbia and Manitoba are a shade better than a while back, though what business is done in the Western provinces is of a steady nature. The Maritime provinces and Quebec are holding their own favorably.

READERS

The Editor wishes every one interested in

Domestic Sanitary Heating and Ventilating Engineering

to make use of this paper. Any article or problem of interest, any topic of note will be used if any such has a tendency to uplift the Trade.

Every local or provincial association can use this paper free of charge to make other members acquainted with the business done and benefits derived from being an organized body.



THE ELGIN

The man who installs closets is more vitally interested in the wearing qualities than the man who buys. Because one stands to lose a reputation and the other only the price of the fixture.

You seldom get credit for installing a good closet—but you sure do hear about a poor one.

The Elgin is designed, built and sold to give you satisfaction. It is built with the strength of Gibraltar in all its parts, and designed to maintain a cleanliness that is next to godliness.

You ought to know more about the ELGIN.

The James Morrison Brass Mfg. Co.
LIMITED

93-97 Adelaide Street West, - Toronto, Canada

**Our Mixed Metal Sales Amount to Over \$5,000,000
Annually**

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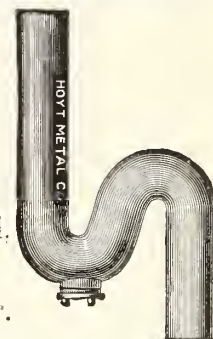
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Let the goods prove their worthiness of a place in your stock. Send a trial order.

Hoyt Metal Co.,

New York, N. Y.; London, Eng.; St. Louis, Mo.

Toronto, Ont.

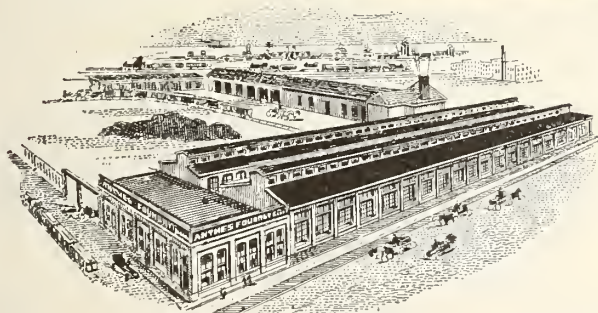


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ANTHES FOUNDRY LIMITED

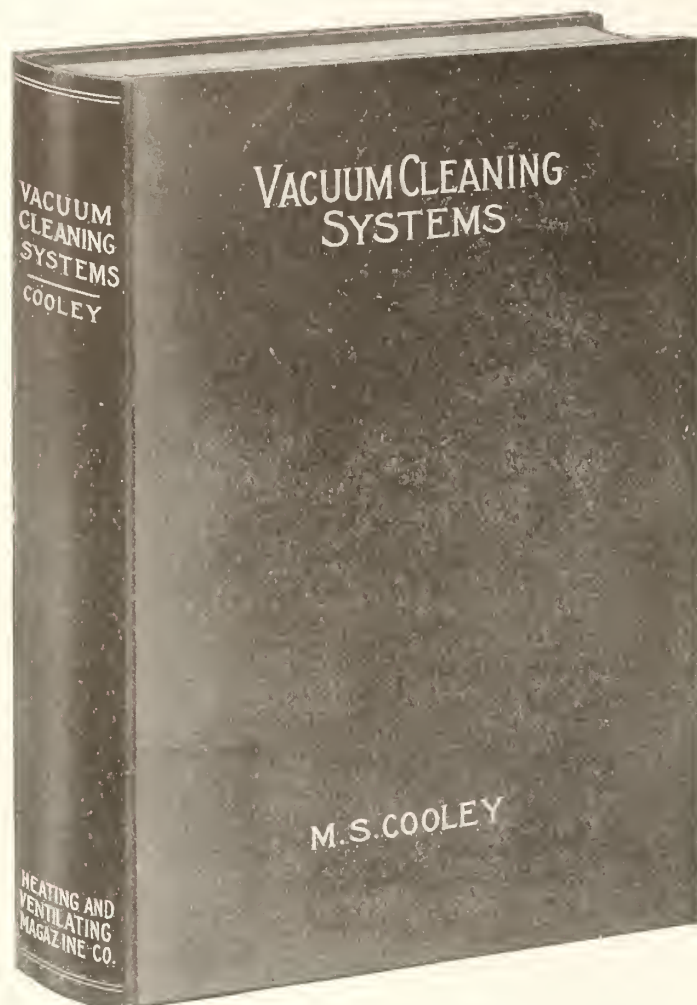
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OF
**CAST IRON
SOIL PIPE
AND
FITTINGS**



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Have you got your copy yet?



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By M. S. COOLEY

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Architect, Treasury
Department, Washing-
ton, D.C.

*244 pages, 6 x 9 inches.
105 Illustrations. 20 Tables.*

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The first full and authoritative treatise on the art of vacuum cleaning. Contains all of the author's important tests of vacuum cleaning apparatus, history of mechanical cleaning, requirements of an ideal vacuum cleaning system, together with chapters on the carpet renovator, other renovators, stems and handles, hose, pipe and fittings, separators, vacuum producers, control, scrubbing systems, selection of cleaning plant, tests, specification and portable vacuum cleaners.

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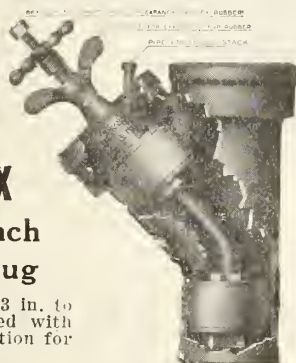
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hang

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SIMPLE

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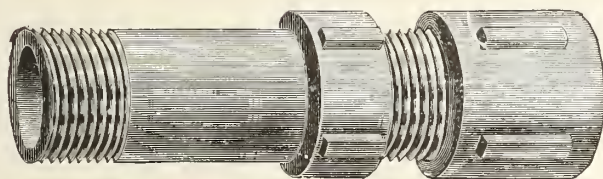
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The
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All plugs from 3 in. to
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water.

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**"CLIMAX" Super-Excellent
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prevent leaks and loss by waste.

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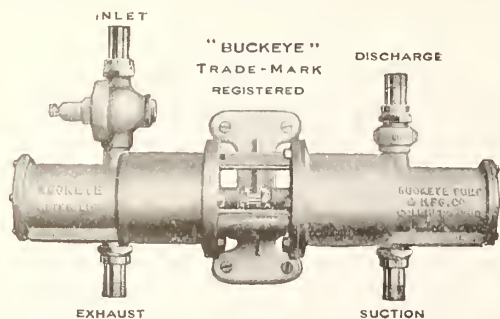
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For Automatically supplying cistern water for laundry, bath, etc.

The "Buckeye" delivers the service that builds up your profits. "Buckeye" buyers become "Buckeye" boosters, because:

The operation is positive, economical and noiseless. The construction is simple, practical and durable. The connections are easily get-at-ible—see cut. The installation may be either right or left-hand. The pump cannot stop or stick on centre.

The pump runs only when cistern water is used. Check valve on pump prevents back pressure on motor.

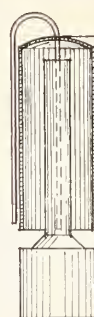
Only seven cup leathers and two stuffing boxes.

The pipe connections are of uniform size.

"Buckeye" means greater water-lift profits.

May we send you catalog and prices?

The Buckeye Pump & Manufacturing Co.
COLUMBUS, OHIO, U.S.A.



MEARN'S SIPHON FOR SEPTIC TANK

This Siphon has no springs or valves—There is nothing to get out of order—Once installed will last practically for ever without any attention—Endorsed by Prof. Starkey of McGill University, Montreal.

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Quality all the way through

SYDENHAM
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Plumbers' Brass Goods

Ask your jobber about them



No. 614

Manufactured by

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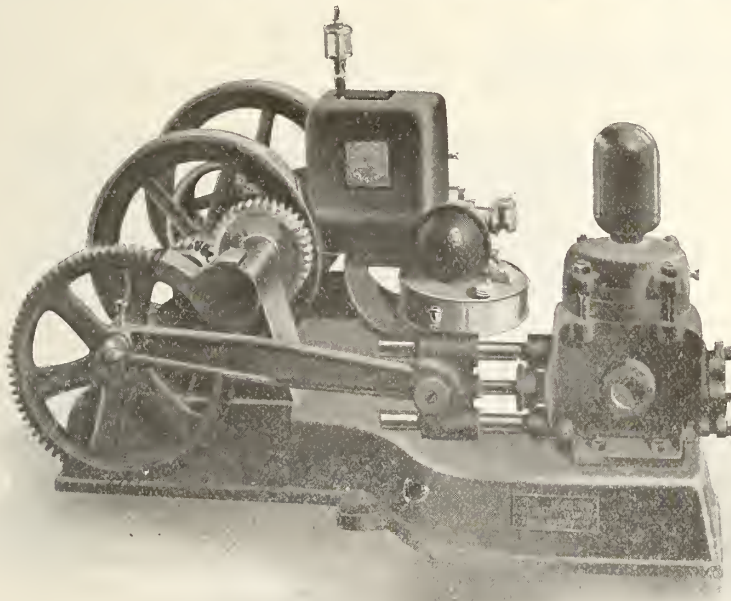
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G. M. C. WATER SYSTEMS



When you want a fool-proof
Gasoline-driven Pump try
our

"Invincible"

Made with direct-connected
Gasoline Engine as shown,
with direct-connected
motor, or for Belt drive.

All mounted on a heavy
Cast Iron Base requiring
no foundation.

The General Machinery Co., Limited

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A Few Dollars More a Week

makes a big difference in your yearly income.

Have you ever thought how you might add to your weekly salary without interfering with your regular work?

Will you let us solve this problem for you?

So far this year, we have shown seventy-five enterprising and ambitious clerks how to make \$5.00 a week more during their spare hours. They will each make additional salary every week this year, and longer should they wish.

If you would like us to show you, write to-day.

This is genuine.

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A want ad. in this paper will bring replies from all parts of Canada.

Condensed or "Want" Ads.

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DOMESTIC ELECTRICAL WORK BY William A. Wittbecker. Concise and Practical Explanation for Sanitary Engineers on How to Wire Buildings for Bells, Alarms, Annunciators, and for Gas Lighting from Batteries. The information given is practical, and with a close observance of the directions laid down, any one, though entirely ignorant of electricity, should be able to do the work described. Illustrated with 22 diagrams. Price, in paper, 25c postpaid. Price, in cloth, 50c. MacLean Pub. Co., 143 University Avenue, Toronto.

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Keep in mind the dominant fact that mankind from its first appearance on the earth has been schooled by nature to look for signs; for invitations to taste; for suggestions as to what to wear. Tell your story briefly, forcibly, truthfully, and address it through the proper media and you can successfully apply advertising as a means to increased distribution.



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FOR THREADING PIPE OR BOLTS

KNOWN, USED,
COMMENDED EVERYWHERE

PIPE MACHINES,

both Hand or Power

HINGED PIPE VISES

PIPE CUTTERS

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BARD ADJUSTABLE

BUSHINGS

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**THE ARMSTRONG M'F'G.
CO.**

317 Knowlton St.

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Education an Investment

The Anglo-American Sanitary Correspondence College

(A SCHOOL FOR PLUMBERS CONDUCTED BY PLUMBERS)

TEACH IN YOUR OWN HOME

—Course A—

THE THEORY AND SCIENCE OF PLUMBING

A course to train apprentices and helpers in the technical part of their business and enable them to pass their examinations when proficient.

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Preparing proficient plumbers for the positions of Sanitary and Plumbing Inspectors.

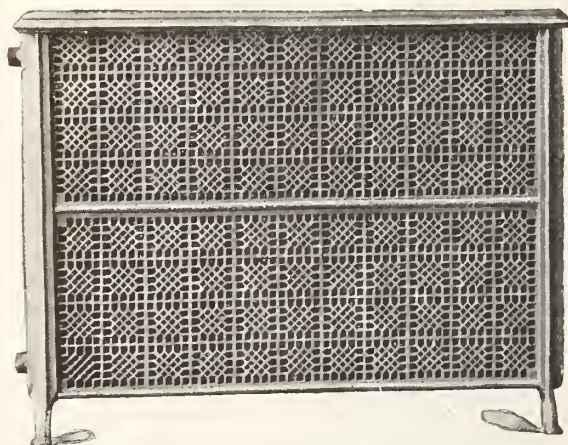
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The Latest Achievement in

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1/3 Weight, 2/3 Size, 1/10 of Water necessary
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Try It Once, Use It Always

We want you to try out Mueller Rapidac, the new Rapidac Compression. Tried once you'll become a regular user—you'll be as enthusiastic about it as other Rapidac Plumbers.

MUELLER RAPIDAC

Is Fuller in shape, Compression in make. Opens and closes quickly and easily, but it won't open by pressure. Made in bibbs, basin and bath cocks, with top or side handles. We are selling seeds of it. Join the army of Rapidac Plumbers.

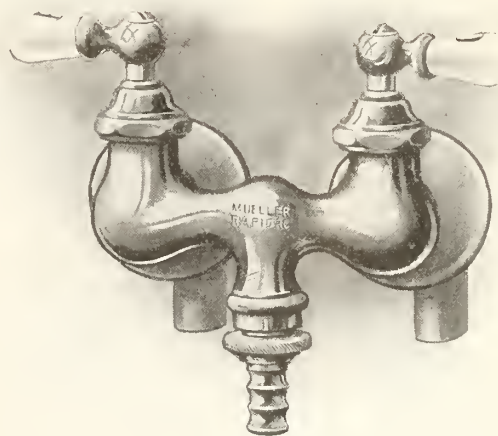
A Beautiful Hanger.

Send for a Rapidac Hanger. A work of Art in eight colors. Doubly attractive with the light shining through it.

Made in Canada.

H. Mueller Mfg. Co., Ltd.
SARNIA, ONTARIO

Makers of High-Grade Plumbing, Water and Gas Brass Goods.



D-9442

H. MUELLER MFG. CO., LTD. S.E.
Sarnia, Ont.

Gentlemen: — Send me Rapidac Hanger catalog and prices on Mueller Rapidac.

Signed

City Province

No Leader Screws and Nuts in the Premier Die Stock

—and it threads 1 to 2 inch right and 1 to 2 inch left with one set of dies.

It starts itself on the pipe, also throws itself out after a "Briggs" Standard Thread is cut instead of backing off which spoils the dies.

The new patent **Off-Set Die**, which can be used only in the "Premier," has overcome the difficulties that go hand in hand with leader screws and nuts—and is made in such a way that once over the pipe it accomplishes what any other make of die would in going over twice. One set of teeth is much lower than the other, consequently every tooth does an equal amount of work.

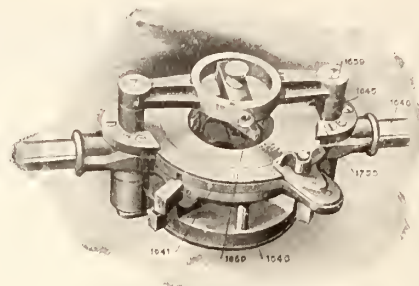
No loose bushings to carry around or lose.

The "Premier" has but one lock, and that is used only when changing from one size to another. The centering device has a scroll cam, without locks, which operates the three jaws that guide the die stock on pipe.

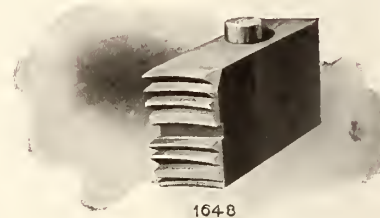
A novice can easily operate the Premier efficiently.

Write for price and full particulars.

Borden-Canadian Company
66 Richmond Street East, TORONTO, ONT.



Die Stock Open



Two Dies in One

MOTT COMPANY, LIMITED

134-136 BLEURY STREET

MONTREAL, QUE.

Fine Grade Plumbing Appliances in solid Imperial Porcelain and Enamelled Iron.

Baths, Lavatories, Kitchen and Pantry Sinks, etc.

Hospital Sanitary Fixtures and Equipment.

Ornamental Lamp Posts, Display and Sanitary Drinking Fountains.



Mott's "Madison" Bathroom Fine Grade Fixtures at Moderate Prices

If building, send for our complete catalogue showing latest up-to-date Plumbing installations or call at our show-rooms and inspect the most complete exhibition of sanitary Plumbing appliances ever made in Canada.

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Bronze to Bronze at the Joint

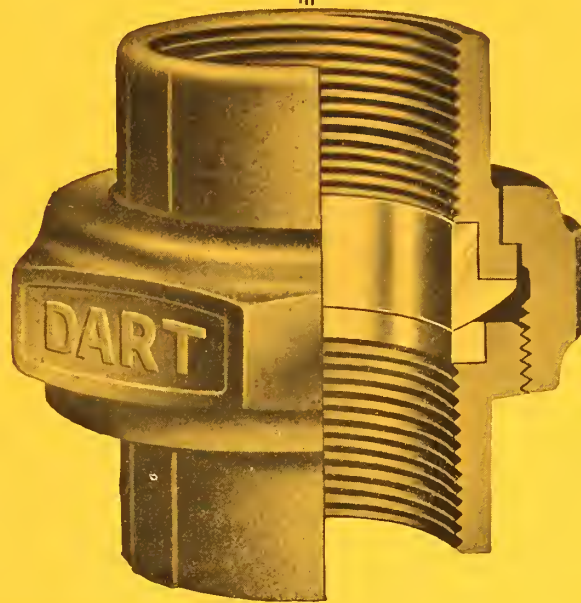
When you draw the Bronze faces of the **Dart Union** together you have a joint that defies time, pressure, corrosion, vibration, contraction and expansion.

The Ball-Shaped Joint makes pipe connecting easy, whether pipes are in or out of line.

Using Dart unions on your pipe installations makes for pleased customers because they leave no room for complaints.

Any union on which is cast the trade-mark as shown on illustration will be replaced two for one if defective.

This means no corrosion and long service



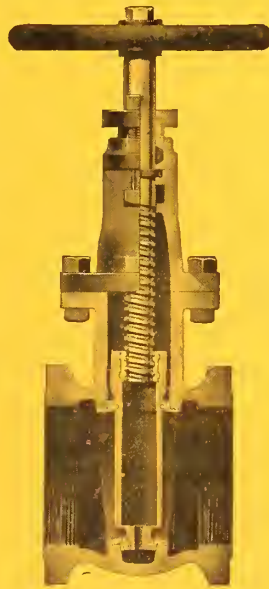
Order from your Jobber

Made by Dart Union Co., Ltd. Toronto

K E R R **(New "KEYSTONE" Pattern) GATE VALVES**



If you have not used any of these New Pattern Valves, specify "KERR" in your next order. We want you to get acquainted with the most reliable valve on the market.



If you have been using them, we are confident that our satisfaction will bring us your repeat orders. These valves will never cause you or your customer the slightest trouble. Their high quality is consistent.



When you buy a "KERR" Valve you get a guaranteed article that is backed by a reliable firm. Many of the largest distributors of valves in Canada have sold "KERR" Valves for over 25 years, and are still recommending them as the "Best Valve."

Write us for particulars.

Kerr Engine Co., Ltd.,

Valve Specialists

Walkerville, Ont.

“RAPIDO”

(RAPID OPENING)

SINK BIBB

SET SCREW FLANGE



The design that will please your customers.
Plain Handle and Flange.
Encased Washer.
Anti Splasher.

“ADJUSTO”

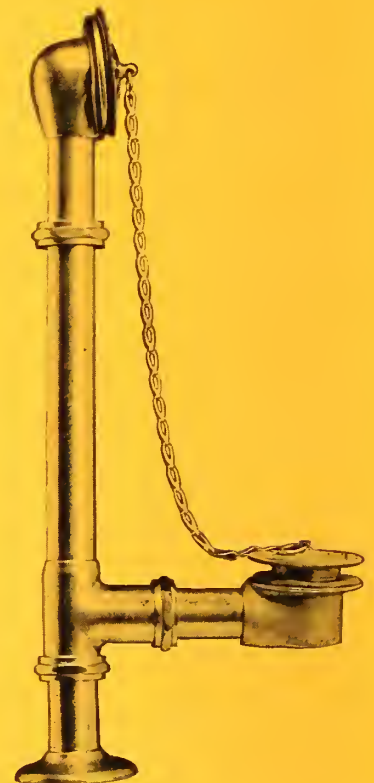
Overflow and Waste Tubes
Telescope 

*“Use Adjusto when in a hurry,
Saves half the time and all the worry.”*

Any article of our make proving defective through inferior metal, or improper workmanship, on our part, will be replaced with TWO good ones, at NO CHARGE to you.

GALT BRASS

Galt, Canada



THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

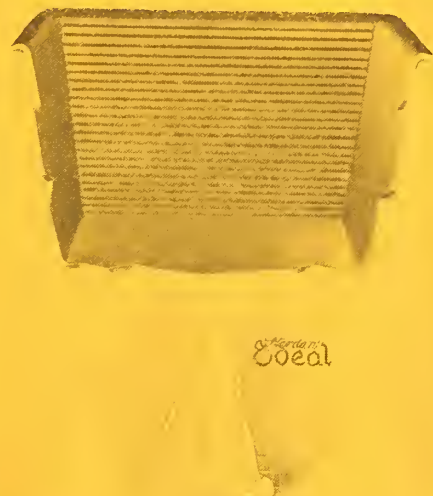
THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

Publication Office : TORONTO, JUNE 15, 1914

No. 12

"HERCULES ENAMEL" LAUNDRY TRAYS With "Cast-In" Washboard



A NEW IDEA—A NEW ENAMEL—A LAUNDRY TRAY WITH A TRANSPARENT ENAMEL AND A WASHBOARD CAST IN THE TRAY.

"Hercules Enamel" is the Ideal Enamel for Laundry Equipment. It is more durable than white porcelain enamels, and will not chip, crack or craze.

The Cast-in Washboard is a feature of these trays. The old-fashioned Separate Washboard is very inconvenient and unsatisfactory; it must frequently be repaired or replaced. In the new "Hercules" the Washboard is there forever.

It's New—It's Practical and Durable and—It's Cheap. Write for circular and prices.

MADE ONLY BY

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

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119 King St. East

MONTREAL
42-44 Beaver Hall Hill

WINNIPEG
76-82 Lombard St.

VANCOUVER
410 Carter Cotton Bldg.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

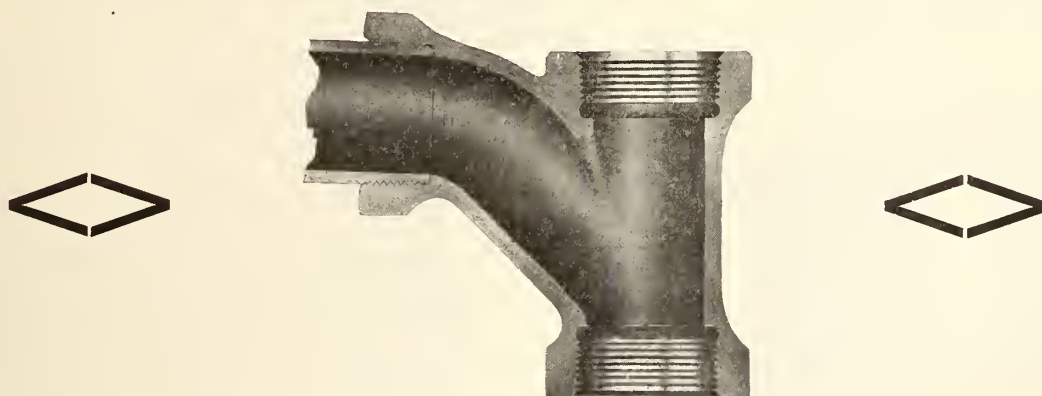
ONTARIO:
Monarch Brass Mfg. Co.,
178 Victoria St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes,
120 Lombard St., Winnipeg

BRITISH COLUMBIA:
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RECESSED DRAINAGE FITTINGS

**We are now Manufacturing
a complete line**



FITTINGS LIMITED OSHAWA

MONTREAL

WINNIPEG

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THE DAISY BOILER

**Over 55,000
DAISY
Boilers**

are giving the best of service throughout Canada.

The Daisy has qualities which make it a better proposition than any other on the market.



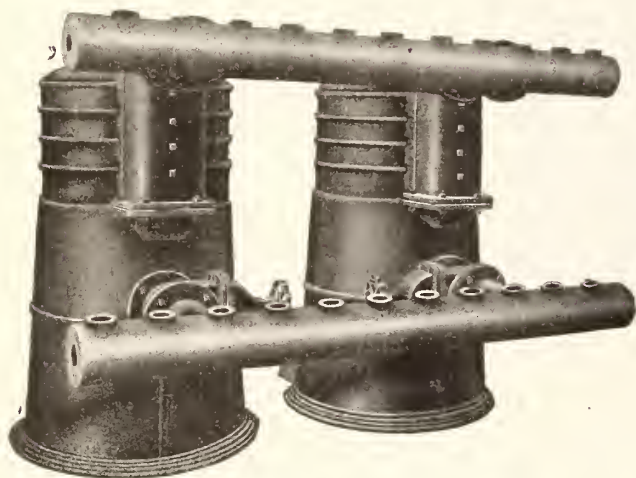
Made in the best equipped plant in Canada.

Without doubt the most popular boiler made.

Every installation means another customer satisfied.

Minimum consumption of fuel.

Maximum amount of heat.



Rear view of two Daisy Boilers connected with twin headers. This system gives great satisfaction in mild and extreme weather.

WARDEN KING LIMITED, MONTREAL
BRANCH, 200 Adelaide St. West, TORONTO

AGENTS:

The CRANE & ORDWAY CO., WINNIPEG, MAN.
The MECHANICS' SUPPLY CO., Limited, QUEBEC, P.Q.
The JAMES ROBERTSON CO., Limited, ST. JOHN, N.B.
The WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

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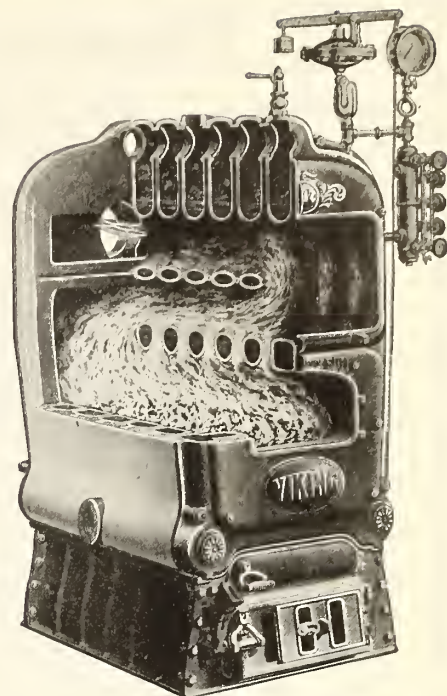


THE “VIKING” BOILER

For Steam or Hot
Water. Always gives
satisfaction

Easy to regulate

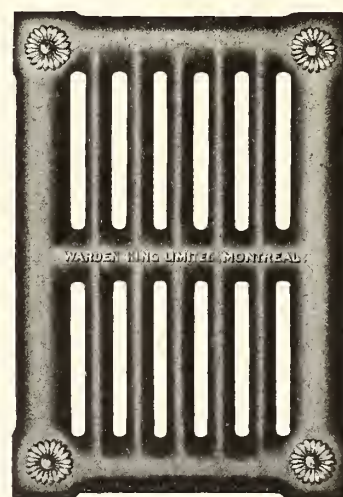
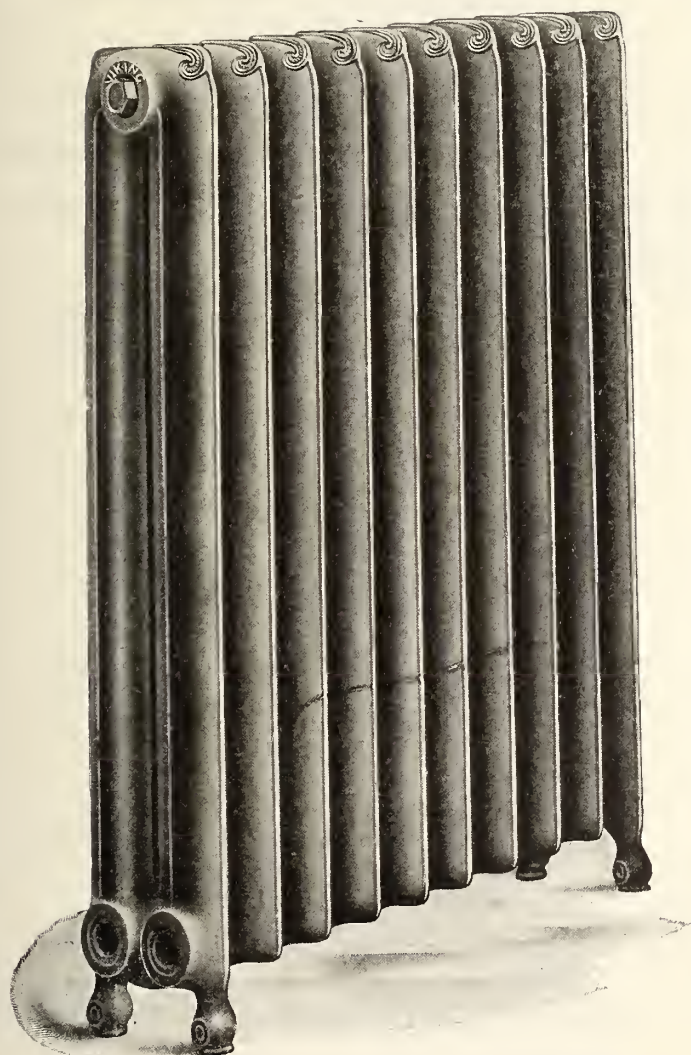
Easy to Clean



“VIKING” RADIATORS

The Newest and Neatest
on the Market

SEND
FOR
CATALOG



Warden King Limited
Montreal

Mr. Plumber,--

DO YOU GET FULL VALUE FOR YOUR MONEY?

Buy "M. R. M." Pipe and save time, by doing better and quicker work, which means increased profits and satisfied customers.

It is always found true, uniform and reliable—each length as perfect as the last. Every length of "M. R. M." Pipe is tested to 600 lbs. per square inch.

Practical plumbers prefer to use it because it is labor saving and easy on the dies.

Always specify for "M. R. M." Brand Pipe.

THE STEEL COMPANY OF CANADA, Limited

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Toronto

Montreal

Winnipeg

Halifax, N.S.

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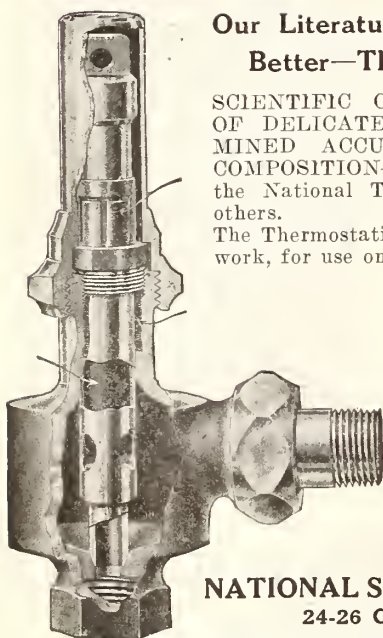
Vancouver, B.C.

Victoria, B.C.

National Valves.

Scientifically
Economically
Usefully

Correct



Our Literature Tells Why They're
Better—Their Use Proves It.

SCIENTIFIC CONSTRUCTION—ABSENCE OF DELICATE PARTS — PRE-DETERMINED ACCURACY — BRASS-ENCASED COMPOSITION—all of these are features of the National Thermostatic Trap—there are others.

The Thermostatic Valve is adapted to various work, for use on Vacuum Systems, Dry Kilns, etc., etc., and is guaranteed for 5 years.

If you want Perfect Service, based on perfect valve principles, the National Thermostatic Valve will answer this purpose.

Write for our literature on the complete National Line, such as the B Heat Intensifier, B Pipe Joint Compound, "Perfection" Radiator Fitting, etc., etc.

NATIONAL STEAM SPECIALTY CO.

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Surplus, Dunn & Co., 74 Murray St., New York
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Moncrieff & Endress, Limited, Scott Bldg., Winnipeg

300,000 lbs.

carried in stock for immediate
shipment of

Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

Brass and Copper Rod.

Brass and Copper Sheet.

WRITE US FOR PRICES

Tallman Brass & Metal Co.
HAMILTON, ONT.

"Standard Sanitary"

Plumbing Fixtures



"Standard Sanitary" Bathroom of Queen Victoria of Spain.

The above cut was made from a photograph of the fixtures actually installed in the Royal Palace of La Magdalena, Santander, Spain, the summer residence of their Majesties, the King and Queen of Spain.

A similar bathroom was also installed for the King, and eighteen other complete "Standard Sanitary" Bathrooms for the other members of the household.

This is an extremely practical and beautiful interior and combines with beauty and refinement every modern sanitary idea.

The fixtures are set into the tiling, thus offering no place for dust or moisture to collect, and reducing cleaning labor to a minimum.

The Foot, Sitz and Shower Baths make an unusually complete and artistic bathroom at a cost that is very reasonable, considering the quality of fixtures shown.

"Standard Sanitary" plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales-agents throughout the Dominion.

Standard Sanitary Mfg. Co., Limited

General Offices and Factory:

ROYCE AND LANSDOWNE AVES., TORONTO, ONT.

Toronto Store:

55-59 Richmond Street East.

Hamilton Store:

20-28 Jackson Street West.

SOMETHING

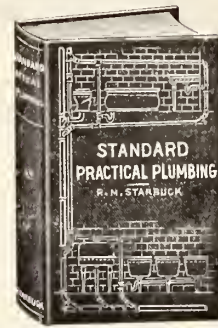
NEW

THE GEYSER
AUTOMATIC
WATER HEATER

is composed of a vertical cylinder from four to six feet long, according to size. The cylinder contains brass pipes which receive the steam and transmit heat to the water. These pipes are screwed to the base chamber, but remain independent from one another at the top, consequently, the expansion is entirely free, and leaks are impossible.

FULLY GUARANTEED
MANUFACTURED BY

THE E. S. MANNY CO.,
MONTREAL



A WANTABLE BOOK

Standard Practical Plumbing

By R. M. Starbuck

347 SPECIALLY MADE ILLUSTRATIONS

PRICE \$3.00

"Standard Practical Plumbing" is indispensable to the Master Plumber, the Journeyman Plumber, and the Apprentice Plumber. As the book is specially strong in the exhaustive treatment of the skilled work of the plumber, it commends itself at once to every one working in any branch of the plumbing trade. Send for it to-day.

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MACLEAN PUBLISHING COMPANY
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WOLVERINE

QUALITY

Wolverine Flush Valve

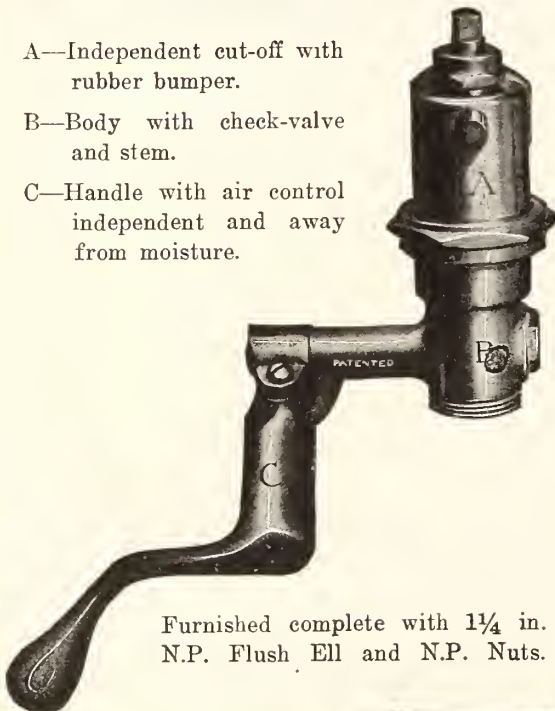
PATENTED

Durable - Inexpensive - Economical - Simple

A—Independent cut-off with
rubber bumper.

B—Body with check-valve
and stem.

C—Handle with air control
independent and away
from moisture.



Furnished complete with 1 1/4 in.
N.P. Flush Ell and N.P. Nuts.

The only Direct valve on the market. No small by-passes to stop up or corrode and each valve is furnished with independent cut-off with rubber seat bumper.

Flush can be adjusted without shutting off the water.

For Direct pressure or gravity systems. Write us for price and further information.

Manufactured and guaranteed by

Canadian Wolverine Co.
LIMITED

Chatham, Ont.

EVERY ARTICLE

GUARANTEED

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TRADE
B.O.T.
MARK

Syphon Closets

The Trade-Mark Represents an Unconditional Guarantee of Five Years



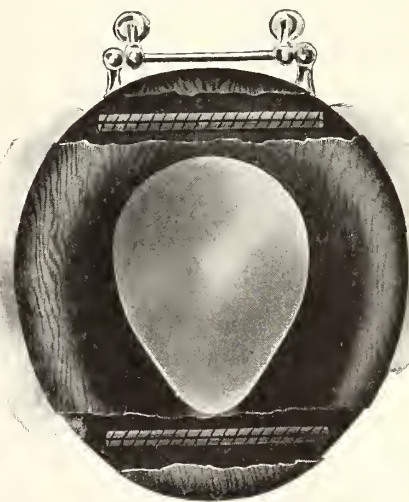
B. O. T. wood tanks are made with a hidden lock-dovetail joint without screws, nails or clamps, and guaranteed under any conditions against cracking, warping or splitting. FITTINGS—substantial and heavy pattern, together with the B. O. T. compound lever ballcock. Linings are cold-rolled, ten-ounce copper, shaped on our own machine and NOT hammered over a form.

B. O. T. woodwork can be supplied in any desired finish or colour. From genuine mahogany to regular straight cut oak. Also vitreous china and white Zapon finish.

B. O. T. NON-CLOGGING BOWLS are made with a straight expanded down leg, expanding where others contract, and absolutely guaranteed against clogging. Quietness of action is due to the fact that the total length of the passage is less than in any other closet.

B. O. T. seats are straight-grained and made with a spiral lock dowel going through back and front, and unconditionally guaranteed for five years against cracking and splitting.

Write for our new 1914 Catalogue.

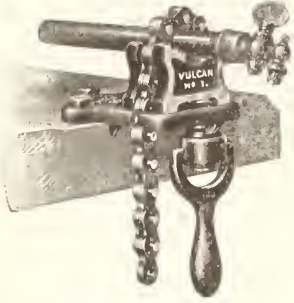


The B. O. T. Mfg. Company, Limited

B.O.T. Building, 159-161 Richmond Street W., TORONTO

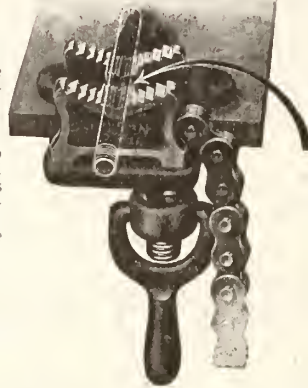
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Williams Unusual "VULCAN"!



BECAUSE "VULCAN" Vises are unbreakable in service.

BECAUSE no other vise will hold irregular shapes as well. Either Fittings or Pipe are "meat" for the "VULCAN."

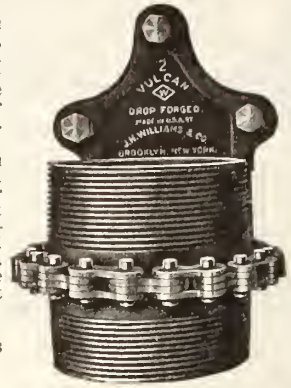


Send for Dependable Chain Tools Pamphlet or consult your dealer.

BECAUSE if you wish to bend pipe, no other Vise will help as much. Use an eye-bolt in one of bolt holes for "staying" the pipe.

BECAUSE if you don't want to bend the pipe no other tool will prevent it in a better way — see the extended teeth on jaws (No. 1 size) and the "wrapping" contact of chain.

3 sizes, capacities 1/8 to 8" pipe.



J. H. Williams & Co., Superior Drop-Forgings 77 Richards Street, Brooklyn, N.Y. City.

PEASE IDEAL STEAM BOILERS

Write to-day for Catalogue and Price
Pease Foundry Company

LIMITED

Works: Brampton. Head Office: Toronto.
Branches: Vancouver, Winnipeg, Hamilton
Montreal.

TWO CENTS PER WORD

You can talk across the continent for two cents per word with a Want Ad. in this paper.

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal

Works: Lachine Canal

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NICHOLSON MADE FILES

SANITARY ENGINEERING FILES

Among the 4,000 different types of NICHOLSON - MADE - FILES, are many styles devised exclusively for sanitary engineering work.

They are illustrated and described in the NICHOLSON catalog, a copy of which will be mailed you promptly on request.

Most of these styles are carried in stock by your dealer—or can be secured by him on special order in a very short time.

For over 50 years, NICHOLSON-MADE-FILES have been the acknowledged standard of economy and efficiency in files.

90% of all files used in Canada to-day are NICHOLSON-MADE. After reading "File Philosophy" (a complete file education in an hour), you'll appreciate why this is so.

Let us send you this interesting little booklet and our complete catalog FREE. Your name and address on a card will bring them to you.

Ask at your Dealer's or Supply House for NICHOLSON-MADE-FILES.

BRANDS:

**Kearney & Foot
Great Western
American
Arcade
Globe**

**NICHOLSON FILE
COMPANY**

PORT HOPE, ONT.

100% Efficient Heating Service

is assured if you install a

"RELIABLE" Vacuum or Vacu-Vapor Heating System

Here are a few reasons why:—

Even Heat Distribution, in zero or mild weather at any temperature desired.

Instant Results. Not necessary to wait until the cold air is forced out of the pipes and radiators, before heating begins.

Noiseless. No hissing radiators or hammering in the pipes.

No vapor escape, to cause a humid atmosphere.

No odors or gases.

No leaky Radiator Valves.

No adjustments necessary, as all attachments are permanently adjusted at the factory.

Great fuel Economy, because less steam pressure is required to operate system and maintain desired temperature.

Flexibility. The 3 styles of "Reliable" Systems—Air Line, Return Line and Vacu-Vapor—are equally efficient for large or small plants; and any style of building. Can be installed without changing piping of old systems.

These and many other advantages are thoroughly described in our "Reliable" Heating Catalog. Write for your free copy to-day, together with large charts showing typical layouts and styles of installation. Ask for Booklet "R".

**The
BISHOP-BABCOCK-BECKER
Company
CLEVELAND, O.**

HONEYWELL HEATING

USED EVERYWHERE BEST ANYWHERE

For the length of time the HONEYWELL SYSTEM has been on the market—(since 1906)—through its unexcelled merits that were readily recognized and appreciated by the heating fraternity—its growth has been phenomenal.

Just think, until eight years ago the Honeywell Method of Hot Water Heating was unknown to the trade. Now, it is not only known but universally used in all parts of the world where artificial heat is required.

There is nothing intricate or complicated about the

Honeywell Heat Generator

It is a simple, practical device containing no valves or mechanical parts—simply *two open tubes* through which water and mercury can circulate. It causes water to circulate more rapidly and maintains higher average temperature in radiators, thus greatly increasing the efficiency.

The HONEYWELL HEAT GENERATOR is the final solution of the problem of safely carrying pressure on a Hot Water System. It is impossible to get more than 10 lbs. pressure on any hot water plant equipped with this generator.

Among the commendable features of the HONEYWELL SYSTEM are:

Perfect heat control under any climatic condition;

Smaller and less piping; easier to install;

Ability to send water temperature quickly to 240 degrees (without boiling);

Greatest efficiency and economy;

Operates on normal water temperatures during ordinary winter weather.

The HONEYWELL SYSTEM is satisfactory all round—to the home owner as well as the man who installs the system. The hundreds of thousands now in use are its best indorsement.

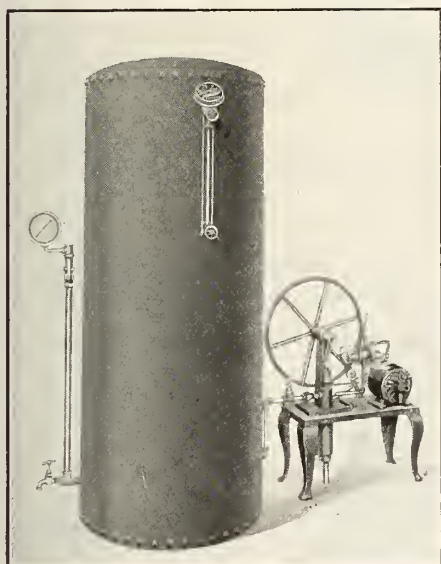
Handled by leading dealers in heating supplies.

The Honeywell Heating Specialty Co.
Wabash, Indiana

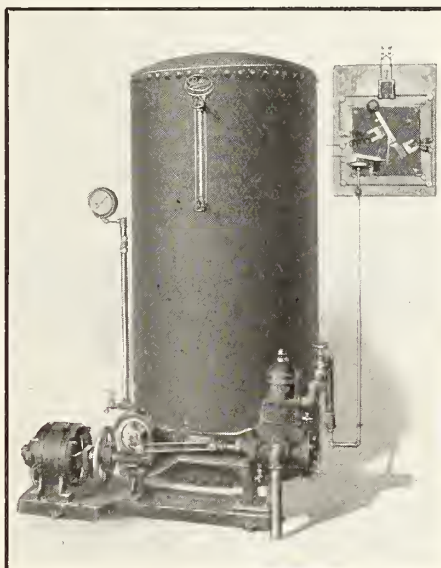
Seerless

WATER SERVICE SYSTEMS

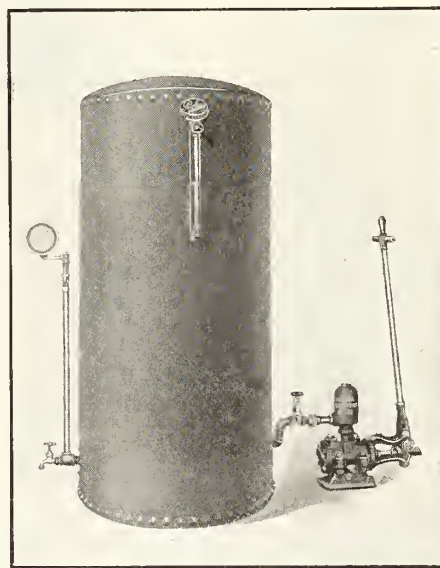
Made by Canadian Workmen
Sold by Canadian Plumbers
Guaranteed by Canadian Manufacturers
A System to Suit Every Requirement



300 Series



400 Series



112 Series

National Equipment Company, Limited
Toronto - Canada

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ASHDOWN'S WATER SUPPLY SYSTEMS

Convenient



Reliable

For country homes, farm use, summer resorts and isolated public and private institutions. Power and hand operated.

Any dealer can sell and easily install these systems.



Running water is no longer a luxury. A system for every condition and every purse.

Affords fire protection and modern conveniences. Stock watering and domestic use.

A country home with the modern conveniences of up-to-date plumbing and running water

Until recently, only those that were within reach of a city water supply were able to enjoy these conveniences, but with the aid of the Pneumatic Water Supply Systems, this condition of things has been changed.

A request will bring to you a supply of free booklets with your name printed on the front cover for distribution among your customers.

The J. H. ASHDOWN HARDWARE CO., LIMITED

CALGARY

WINNIPEG

SASKATOON

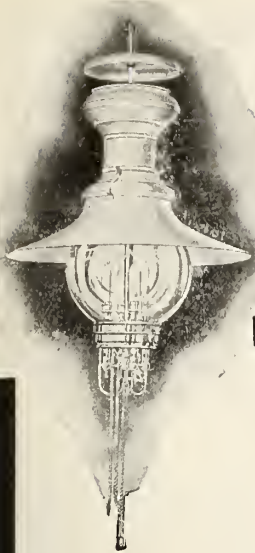
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BARGAINS

(While they last)

In slightly used

Gas Arc Lamps



We have a number of slightly used *Gas Arc Lamps* which we will sell complete at prices away below cost. These lamps are of the type shown in illustration, and are in first-class shape. We have a small number of the inverted mantle arc lamps for sale at cheap rates. Plumbers, lighting supply dealers and others will find it to their advantage to buy some of these lamps. Apply to the "Commercial Manager," care of

The Consumers' Gas Company of Toronto
Toronto, Ontario

PERFECTION FLOOR AND CEILING PLATES

300,000 always on stock.
Sizes from $\frac{3}{8}$ to 4 in.

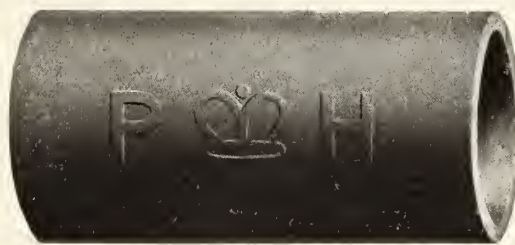
The most popular plate is four No. 10 Hinged Press d Steel or Brass. We manufacture all lines shown on cut.

The BEATON & CADWELL MANUFACTURING CO.
New Britain, Conn.

Eastern Agent: J. R. Devereux, 142 St. Joseph Boulevard West, Montreal.
Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

P^{CH} LAPWELD PIPE

MADE IN SIZES
FROM
2 Inches to 10 Inches



THE ONLY
LAPWELD PIPE
MADE IN CANADA

Note the Brand which appears in raised letters every four feet along each length of pipe.

This Brand is a positive guarantee of excellence, and any pipe bearing the Brand which is found defective will be replaced free of charge.

PAGE-HERSEY IRON, TUBE & LEAD CO., Limited
TORONTO, ONTARIO

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SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, JUNE 15, 1914

No. 12

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SANITARY ENGINEER, PLUMBER and STEAMFITTER of CANADA

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The Testing Room

Every Vitro Tank is tested from one to 150 lbs. before it is permitted to leave our works.

You cannot afford to instal a tank that isn't tested, as it is liable to cause complaints and drive good customers away from you.

8-year-old Vitro Tanks are as good to-day as when installed.

**The
Tested
Kind**

They are composed of material that holds water indefinitely without a lining, and never rusts, decays or soaks up.

We make the **Ball Cock, Flush Valve and Lever** from the best quality ingot metal. These parts work smoothly and noiselessly and will serve many years under hard service without requiring repair.

**Over
160,000
now on the
market**

Write for catalog and full particulars.

Cluff Manufacturing Co., Limited

Office and Factory: 65-75 Sterling Road, Toronto, Ontario

SOLD BY ALL JOBBERS

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STEEL AND RADIATION, LIMITED

"KING" BOILERS



No. 6. High Base "KING" Boiler, Showing Double Shaker.

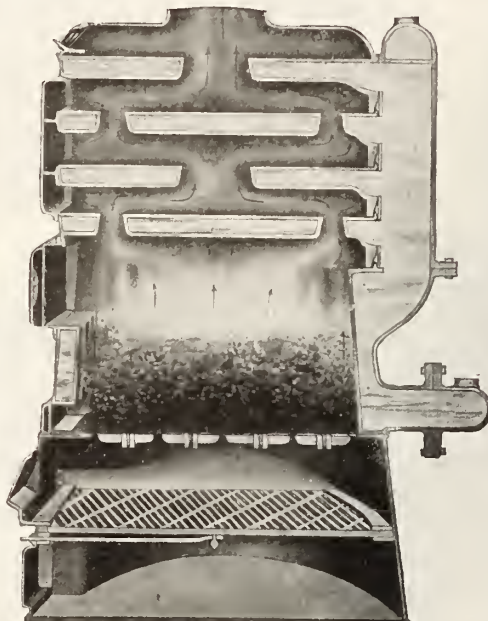
A Hot Water Boiler That Is Standing The Test.

"KING" Boilers carry our unqualified guarantee.

Mr. Heating Engineer,—

Isn't it worth something to deal with a house that has faith in its product and will stand behind the goods they manufacture?

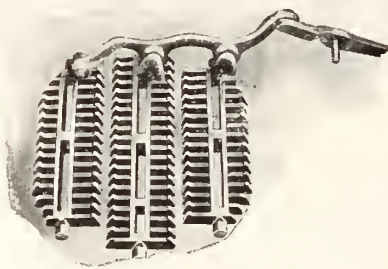
The talking points on a "KING" Boiler are numerous, in fact too numerous for us to attempt to explain them in this limited space. A few of them need no explanation and are shown in the accompanying cuts.



Sectional View of "KING" Boiler, Showing Improved Design of Waterways, Combustion Chamber and Fire Travel.

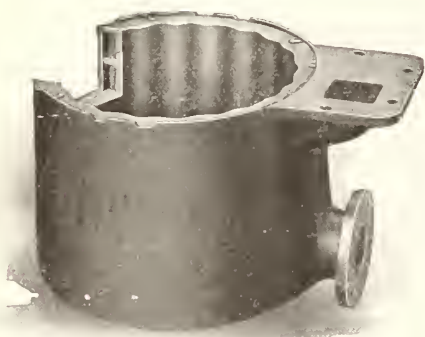
"SPECIAL FEATURES"

The large one-piece ashpit.
The special shaking grates and convenient shaking arrangement.
The fire-pot with a real corrugation.
The well-arranged and properly proportioned combustion spaces.
The easily-cleaned flues.
The double shaker.



Grate Bars and Connecting Bar, Showing Method of Connection Without Bolts or Pins.

The perfect fit doors.
The thin and rapid circulating waterways.
The extended and scientifically arranged heating surfaces.
The absence of defective sections on account of the use of iron patterns.
The ease of erection.

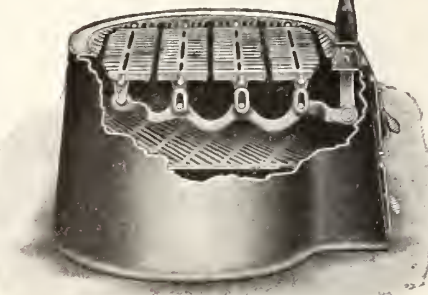


"KING" Fire-Pot, Showing Wide Corrugation, Adding One-third to Heating Capacity.

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Try us for your Valves, Pipe and Fittings, as well as Boilers and Radiators. Right prices and prompt delivery.



"KING" One-piece Ashpit, Showing Patented Improved Trouble-proof Grates and Shaking Mechanism, Free from Bolts or Pins.

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THE SANITARY ENGINEER

VOL. VIII.

JUNE 15, 1914.

No. 12



Group in attendance at the convention of the Canadian Society of Sanitary and Heating Engineers, taken at St. Patrick's Hall, Ottawa.

The Thirteenth Annual Dominion Convention

Canadian Domestic Sanitary and Heating Engineers Meet at Ottawa—Business of a Vital Nature Discussed—Entertainment Features Proved of an Unusually Enjoyable Nature.

OTTAWA, July 9.—The first business of the convention took place really between various committees on Monday, the day previous to the opening day, when several matters of minor nature were taken up so as to enable the business of the convention to be easily gotten through. It was felt that, as Ottawa had been chosen as the convention city, the members and delegates would enjoy as much time as could possibly be spared on sight seeing. As a result the entertainment committee had a fine programme prepared and wished to impress the visitors with the beauties of Ottawa.

THE OFFICIAL OPENING.

Tuesday, June 9th.

Sharp on time, 9.30 a.m., saw a large gathering of members and delegates at St. Patrick's Hall, and after the usual friendly greetings and hand clasps had been gone through, Jno. McKinley, the

president, called all those present to order, and the business began. It started off in a stern businesslike manner, and of all conventions the writer has attended this was one at which every word counted for something. No repetition and no useless cross-questioning was allowed.

President's Address.

IN opening the convention President Jno. McKinley, Ottawa, addressed those present as follows:—

At the time when these few remarks were compiled it was dubious whether we would have with us any representatives from the western provinces, but I trust that our secretary may be able to lay before us reports from those provinces.

Doubtless the absence of delegates from the western provinces can be attributed to the financial stringency, and the great falling off in the building trade in their various localities may have damp-

ened the ardor of our western confreres in association matters, but in my opinion this is only temporary, and I am glad to state that, notwithstanding those adverse conditions, our western brethren have been holding together in the advancement of their mutual interests.

One feature of great moment in the advancement of our profession is the formation of a strong and enthusiastic institute, the Canadian Institute of Sanitary Engineers, in the Western provinces, whose members are, we understand, composed of not only master plumbers, but also of plumbing inspectors and others, either directly engaged in the business or indirectly as provincial health engineers. The object of this institute is the seeking of legislation governing the installation of plumbing with a view to having a standard plumbing by-law for the western provinces. If some such body were in existence in the east, working in harmony with the present or-



Photos taken on Belle Isle: 1. Jno. Gordon, shouting "Play Ball"; 2. The members' chicks; 3. Tug of War; 4. Harry Sole and "Another" of his lady friends; 5. The Ladies; 6. Jno. E. Godwin, Halifax, Provincial Vice-President for New Brunswick; 7. J. McLaren, Manager Galt Brass Co., Galt.

ganized bodies, with the prospects of success which is attending the efforts of the aforementioned institute, I would venture to say that a great step would then be taken towards the ultimate goal to which we are all looking forward; viz., a standard plumbing by-law for the whole Dominion of Canada.

Bulk Contracts.

A matter of great importance which will be brought to your attention at this convention and from the evil effects of which no doubt we have all suffered, is that of the inclusion of plumbing, heating, ventilation and lighting contracts in bulk with other building trades, both in private and public buildings.

This matter will be the subject of a resolution which will be submitted for your consideration and subsequent action.

Another matter which must receive the attention of the convention is that of the necessity of the trade being represented on all boards of health. This as we all know is very essential if our by-laws are

to be carried out successfully, and at the same time be fair and equitable to both the craft and the public.

Technical training should also receive a great deal of consideration and this is in actual fact one of the most vital questions to the craft. If our craft seek to keep pace with the great progressive strides which are taking place in our calling, our boys must be better trained in their early days than we were. We were not able to receive the schooling that our boys can now have.

In the matter of heating and ventilating work, it will be of interest to delegates from the various provinces to learn that the Ontario association have had drafted a form of specification for hot water and steam heating, which in their opinion will not only take care of all contentious elements, but will also serve to standardize and elevate this important branch of our business.

An Executive Body.

The bone of contention which was fought over at the last convention and

which was temporarily buried will again be dug up. The question will again arise whether this Canadian society will not better serve all interests if it is not made a purely executive body.

I may say that I have seriously considered this question during my tenure of office and am frankly of the opinion that, until such time as this advanced step shall be taken, there will be no organization in the provinces which are not now organized, I am well aware that different opinions are held on this matter, but I will now say that in my capacity as president and chairman of the convention I intend to see that this contentious matter will not be discussed until after the more vital and pressing business of the convention shall have been disposed of. There will not be a repetition of the proceedings of last year's convention when, according to the records, the greater part of the convention were taken up with discussion of this matter to the serious hurt of the convention.

Gentlemen, let us get down to busi-



Snapshots of members with their ladies on board the Quinte Queen taking in the river trip down the River Ottawa.

ness and clean up the slate, then fix our future and incidentally seek to enjoy the good time which our hard working entertainment committee have so bountifully made provisions for.

Before closing my address I wish to congratulate the publishers of "The Sanitary Engineer," on the strong and helpful publication under the guidance of the new editor, Edwin Newsome. I personally trust that from coast to coast this publication will meet with the approval of every man engaged in the business of sanitary, heating and ventilation. We especially recognize the wonderful effort put forth on behalf of the trade throughout the Dominion and that at the proper time during the convention you will be called upon to express in a motion a hearty vote of thanks.

The president then called upon the various delegates present to read their reports, which were adopted as read, and no doubt the whole proceedings were carried out in a very able and satisfactory manner. Several items of interest were

given some discussion and having got through the reports the meeting was adjourned till 2 p.m.

The Afternoon Session.

There was a little delay in taking up the afternoon programme because of the fact that various committees were in session, but several topics of interest were discussed. The president did not allow time to lag in any way. The bulk contracting was taken up and various phases of the subject dealt with, as felt in the different parts of the Dominion.

Some very interesting discussions took place on overhead expenses, and G. F. Frankland, the secretary of the Ontario society, read a splendid paper entitled, "A Discussion of Overhead Expenses," by L. Legrow, Toronto. The subject was very well taken and a vote of thanks was indorsed by all present, we have published the article mentioned in full on another page.

Wednesday's Session.

The weather still continued to be al-



Jno. McKinley, Ottawa, retiring president of the Association.



Left to right: 1.—R. Shannon, Toronto; 2.—B. Smythe, Toronto; 3.—W. D. Armstrong, of Canadian Lamp & Stamping Co., Ltd., Ford, Ont.; 4.—R. H. Mueller, of Mueller Mfg. Co., Sarnia, Ont.



1.—The leaders in the auto drive; 2.—The battery seen at Nepean Point; 3.—The last auto and finish of drive; 4.—C. S. Dorman, the new president; 5.—H. A. Knox, Ottawa, and F. Hazelden, of Twyford's, Ltd., Hanley Staff., England; 6.—B. Noble, London, Ontario; 7.—A group of supply men.

most unbearably hot, but in spite of the fact a large number were on hand at the appointed hour and business began. The most important matter taken up was that of the nomination of officers and a special committee was appointed for that purpose.

Nomination of Officers.

The nomination committee asked the convention to re-elect Jno. McKinley, Ottawa, as president, but Mr. McKinley said he hoped they had chosen an alternative as in justice to several others he thought a change should take place in the personnel of president each year.

Therefore the officers mentioned in accompanying panel were nominated.

The next item on the programme taken up was that of the trip down the River Ottawa.

TRIP DOWN THE RIVER OTTAWA.

OF all events at the convention one of the most enjoyable was the trip down the River Ottawa. The steamer "Quinte Queen" left Victoria wharf about 3 p.m. Tuesday with a big crowd on board. A splendid orchestra was in attendance, and the weather man also catered to the proceedings in a very desirable way. Refreshments were supplied in a liberal manner. After sailing down the river several miles, the steamer returned and unloaded the party at Belle Isle for some sport.

The ladies and children made free use of the merry-go-round, and chipped in on all the events, making the pro-

ceedings all the more enjoyable. One young lady tried to elope with Harry Cole, of the James Robertson Co., but the snapshot artist got a snap on them. Frankland had to be assisted round on a wheelbarrow, propelled by Dorman, while Farrell, to smooth matters along the journey, had to pacify Frankland with the bottle.

The pumps and other places of refreshments took on local option by going dry. The tug-of-war took up a little time and proved to be more war than tug because of the fact that both the warring parties tied each end of the rope to either tent poles, seats or old tree stumps, though finally getting down to the tugging proved a draw of 2 to 2. The supply men and manufacturers had the "weighty goods" behind them, but the sanitary engineers had the tree stumps.

A report of the baseball game appears elsewhere.

Returning to the city, each and every one expressed themselves as having enjoyed the trip, and which would not easily be forgotten.

SANITARY ENGINEERS WON.

The baseball game was the event of the week from many standpoints. The teams were picked days before the combat started and rivalry between the players had worked up to the boiling point by the time the Umps inaugurated the hostilities.

As a baseball game it was fearful and

wonderful. After seeing Harry Hicks, the demon pitcher of the Sanitary Engineers, warm up and start to streak 'em over the plate, the idea began to percolate through the crowd that the Supplymen would have to be all Ty Cobbs if they expected to get on the bases much. Hicks had a fine collection of curves and a fast ball with a top to it which he put up around the necks of the batters with deadly effect. Behind the plate was Bob Shannon with a mitt like a pot of glue; at any rate every ball that came along stuck to it. The rest of the team gave a brand of support that was nickel-plated and double-frilled. Was it any wonder that the Supplymen had their work cut out for them in putting the runs over?

Peter McMichael proved a good batter but he couldn't run. Charlie Smallpiece could run but he couldn't bat; Charlie World could neither bat nor run. But it mustn't be supposed that the S.E.'s had everything their own way. Esmonde pitched a gilt-edged brand of ball for the Supplymen and he had the S.E.'s swiping at thin air a good part of the time, and popping out high ones during the rest. But the Supplymen unfortunately for their chances of winning ran to embonpoint (polite term for avoirdupois) rather than speed and the fielding was not just as snappy as John McGraw or Connie Mack would expect.

But it was a hard battle all the way through. Umpire Blyth had a strenuous time of it, but managed to escape without fatal injuries as far as can be learned.



1 and 3—Group of supply men in M. M. O'Connell's auto; 2 and 4—Groups of members and supply men in J. T. Blyth's two cars; 5 and 6—Ottawa members in attendance at the convention.

Still he asserts that he'd far rather go with Roosevelt through Central Africa than attempt to umpire another such game. He says it would be much safer on the whole.

The official score was 6 to 5 in favor of the S.E.'s, but non-official computation makes the number of runs larger with the margin of difference the same. Official records of errors gives the total as 128.

BASEBALL TEAMS COMPRISED THE FOLLOWING:

Sanitary Engineers.

Hicks	Pitcher
Shannon	Catcher
Noble	1st Base
Smyth	2nd Base
Worthington	3rd Base
McKinley	Shortstop..
O'Connell	Right Field
Gibbons	Left Field
Edge	Centre Field
Godwin	Flyman
Supplymen and Manufacturers.	
Esmonde	Pitcher
World	Catcher
Forrest	1st Base
Wall	2nd Base
West	3rd Base
Baxter	Shortstop
Cleves	Right Field
McMichael	Left Field
Smallpiece	Centre Field
Conaughton	Flyman

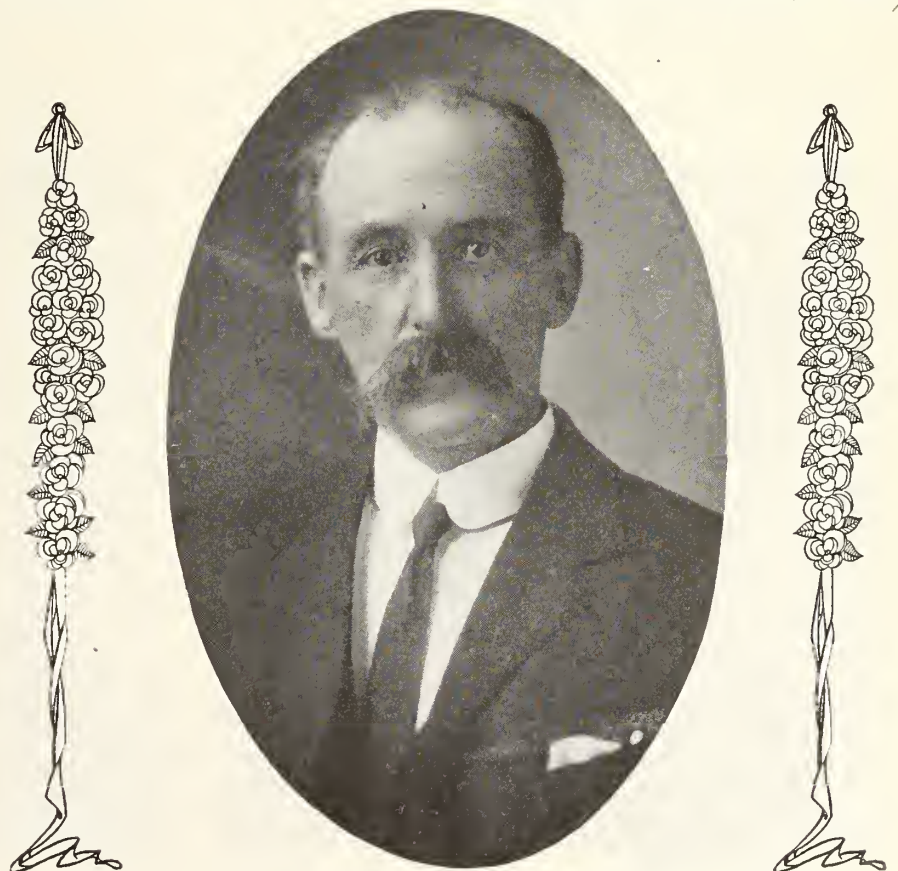
After the trip down the river, the ladies indulged in an evening at the Dominion Theatre, and after enjoying a very fine vaudeville programme, we are told they made a strenuous effort to invade the quarters taken up by the men who had repaired to the Cecil Hotel, where delegates and members, supplymen and manufacturers were enjoying a banquet. However, like all ladies they went on their ways rejoicing and left the male

to do justice to the splendid edibles so ably prepared by the proprietors of the hotel.

BANQUET AT CECIL HOTEL.

THIS was certainly a night of all nights for the gentlemen, and a large gathering was in attendance all of whom were members of the trade or manufacturers and their representatives. Amongst those of the latter as well as delegates to the convention were the following:—

Edwin L. Wayman and W. Lyons, of Standard Ideal Mfg. Co., Ltd., Port Hope; F. W. Esmonde, of Gurney-Massey Co., Ltd., Montreal; F. Conaughton, of Standard Sanitary Mfg. Co., Ltd., Toronto; F. J. Wall of Mott Co., Ltd., Montreal; Geo. Clewes, of Steel Company, of Canada; Chas. Webb, of Warden King, Ltd., Montreal and Toronto; C. M. B. World, Manufacturers' Agent, Ottawa; C. N. Shearer, of Thos. Robertson Co., Ltd., Montreal; Chas. Smallpiece, of Taylor-Forbes Co., Montreal; J. A. Mc-



James Marr, Calgary, Provincial Vice-President for Alberta.



1.—Jno. McKinley, Ottawa and Geo Cleaves, Steel Co. of Canada in auto; 2.—Messrs. Smythe and Shannon, Toronto; 3.—The Ottawa Entertainment Committee, from left to right: Messrs. Chandler, O'Connell, Currie, Gauthier and Band; 4.—G. S. Dorman, Moncton, the newly-elected president of the Society; 5.—Right to left: C. P. Holloway and Jno. McKinley, Ottawa; Jno. Watson, Montreal; 6.—G. F. Frankland, on the water wagon; 7.—Jno. Gordon, Montreal, provincial vice-president for the Province of Quebec.

Laren, manager of Galt Brass Co., Ltd., Galt; P. McMichael, manager Dominion Radiator Co., Ltd., Toronto; F. T. Rawley, of Dominion Radiator Co., Ltd., Montreal; F. Hazelden, manager Twyford's Ltd., of Hanley, Eng., Montreal office; C. A. Sullivan, of Page Hersey Co., Ltd.; R. H. Mueller, of Mueller Mfg. Co., Ltd., Sarnia; A. Betton, of James Morrison Brass Mfg. Co., Toronto; Messrs. W. P. Baxter, G. A. Pratt, H. F. Cole, C. S. Forrest and W. W. Maguire, represented the James Robertson Co., Ltd., Montreal and Toronto; A. W. Gardner and N. E. West, of Montreal, represented the Steel and Radiation Co., Ltd., Toronto.

M. M. O'Connell made a splendid toastmaster and dispensed with the following toasts in a very able manner (and not too liquid either): "The

King," "The Governor-General. "Our Country," "Our Country's Trade and Commerce," and "Our Association."

H. A. Knox responded to the toasts of "Our King" and "Governor-General," and the company responded to the toast for "Our Country" by singing the "Maple Leaf." The toast to "Our Country's Trade and Commerce" was ably responded to by P. McMichael, Dominion Radiator Co., Ltd., Toronto, and Chas. Smallpiece, of the Taylor-Forbes Co., also spoke a few very fitting words.

The toast to "Our Association" was very suitably responded to by John Gordon, of Montreal.

During the evening J. T. Blyth gave a very amusing recitation entitled, "A Plumber's Helper and His Experiences," which added to the evening's enjoyment.

The menu was as follows:—

Appetizer a La Russe
 Consomme Cressonniere
 Cream of Asparagus.
 Olives Salted Almonds Radishes
 Boiled Restigouche salmon
 Hollandaise sauce Duchesse potatoes
 Grilled spring lamb cutlets, French peas
 Kirsch Punch
 Roast Young Vermont Turkey, Stuffed
 Cranberry Jelly
 New Bermuda Potatoes Creamed Spinach
 Lettuce and Tomato Mayonnaise
 Strawberry Shortcake
 Neapolitan Ice Cream
 Roquefort and Canadian Cream Cheese
 Coffee Demi Tasse,
 Noble's Butter Crackers
 After Dinner Mints

Gordon Rogers was the official entertainer, and did his part well. His skill as an entertainer will not be easily forgotten by those who were present at both the banquets held at this convention.

Though quite a few had taken up quarters at different hotels in the city, it was felt that by swelling the list at the Cecil Hotel they would be easily on hand for the last day's business of the convention.

THURSDAY, JUNE 11.

CONSIDERING the fact of having spent such a jovial evening on Wednesday, a fine number were present to wind up the last day's business.

The officers were appointed for the ensuing year, the report of the nominating committee being adopted.

As a very important conference had to be held between the members present and the supply houses, various matters were disposed of hurriedly, amongst which was a vote of thanks to The Sanitary Engineer for the way that publication had upheld the trade interests.



J. E. Godwin, Halifax, Provincial Vice-President for Nova Scotia.



H. Hicks, Toronto.

Several members present spoke of the value Sanitary Engineer was to the trade, and expressed their appreciation in very forceful words. Responding to the vote of thanks, Edwin Newsome, editor of The Sanitary Engineer, stated that the paper stood for everything and anything which would assist in uplifting the trade. It was their official organ, and would always feel pleased to be of service to the profession, and that whenever any topic of interest to the trade could be had it would find space in the pages of The Sanitary Engineer. Mr. Newsome thanked the members present for the kind hospitality shown him during this convention, and for the way the members present had at various times voiced their appreciation of The Sanitary Engineer.

The meeting then took up the question of the conference which would be finally dealt with in the afternoon, after which a splendid drive was planned by the entertainment committee.

AUTOMOBILE DRIVE.

SOON after 4 p.m. a splendid array of autos came into active service, but before embarking an official photographer came upon the scene. After having done his duty, the whole party indulged in as fine an auto drive as could be had. The ladies took the lead, as will be seen by one of the photos the snapshot artist procured, followed by some twenty cars, which followed the leaders along the Rideau Canal, through the Exhibition grounds, where the car and contents belonging to M. M. O'Connell could not pass the baseball match which happened to be in progress. The rest of the autos

went on along the Rideau River, until Dow's Lake was reached, when one of them had the audacity to blow out. However, this trouble was overcome, and on went the party through the grounds of the Government Experimental Farm and back to Major Hill Park, along the new driveway, past the Archives and the Royal Mint, and on over the Minto Bridge, past the entrance of Rideau Hall, and on through Rockcliffe Park to the Rifle Ranges, returning by another route through Rockcliffe Park and on to

Nepean Point, where another snapshot was taken of the battery, which will be seen in one of the grouped views. This event wound up the convention, and each and every visitor present stated that of all cities Ottawa was queen. Many a one said that no wonder Ottawa had been chosen capital of the Dominion because of its beautiful surroundings and commanding position. No city in Canada could give such an imposing and dignified a site for the Dominion Parliament buildings as could beautiful Ottawa.

New Officers Appointed

President.—G. S. Dorman, Moncton.

Vice-President.—E. H. Russell, London.

Secretary-Treasurer.—W. C. Crawford, St. John, N.B.

PROVINCIAL VICE-PRESIDENTS.

Alberta.—James Marr, Calgary.

Manitoba.—A. J. Hammond, Winnipeg.

Saskatchewan.—N. B. Rowntree, Swift Current.

British Columbia.—S. A. Wye, Vancouver.

Ontario.—F. R. Maxwell, Toronto.

Québec.—Jno. Gordon, Montreal.

Prince Edward Island.—B. Shaw, Charlottetown.

New Brunswick.—D. J. Shea, Fredericton, N.B.

Nova Scotia.—J. E. Godwin, Halifax.

CHAIRMAN OF COMMITTEE.

Apprentice.—Geo. Clapperton, Toronto.

Legislative.—J. T. Blyth, Ottawa.

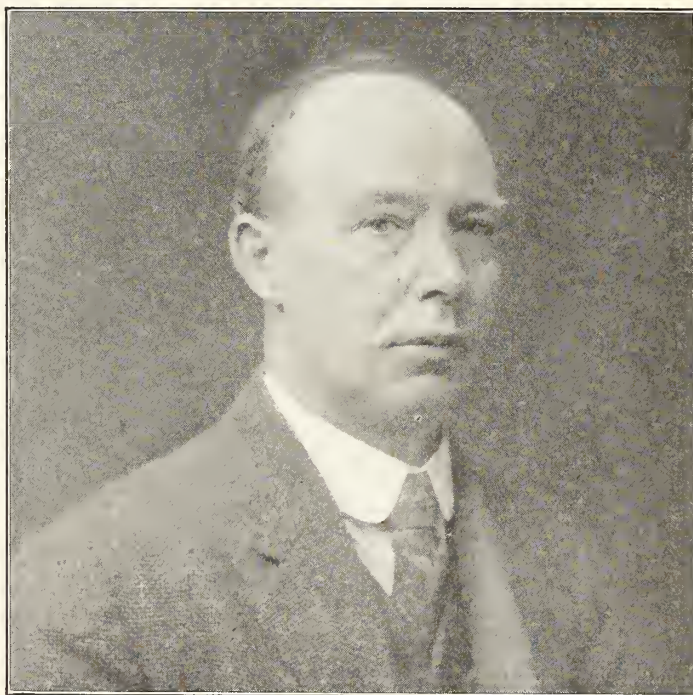
Heating and Ventilating.—J. R. Priestly, Calgary.

Sanitary.—Jno. Gordon, Montreal.

Essay.—L. LeGrow, Toronto.



J. R. Priestly, Calgary, chairman Heating and Ventilating Committee.



S. A. Wye, Vancouver, Provincial Vice-President for B.C.

Spirit of Optimism Apparent at Banquet

Members Gather Around Festive Board at Chateau Laurier —
Dr. Hodgetts Delivers an Address in Which He Establishes the
Importance of the Sanitary and Heating Trades.

WHILE the convention as a whole proved to be one of hard work, there was also a pleasant social side. A banquet was held on Tuesday evening at the Chateau Laurier. A large number of the trade were present, including the suppliers and manufacturers. The Ottawa Association had charge of this event and certainly left nothing undone. About 150 persons were present among whom were:

Those Present.

E. H. Russel, London; G. S. Dorman, Moncton; Jno. McKinley, Ottawa; J. T. Blyth, Ottawa; Dr. Hodgetts, Ottawa; G. F. Frankland, Toronto; Mr. Archambault, Hull; Chas. Smallpiece, Montreal, representing Messrs. Taylor Forbes Co., Ltd.; W. Edge, Ottawa; E. Morton, Ottawa; F. Meade, Ottawa; J. E. Fullerton, Toronto; Miss O'Donnell, Ottawa; J. P. and Mrs. Booth, Ottawa; F. W. and Mrs. Esmonde, representing Gurney-Massey Co., Ltd., Montreal; H. Cole, of James Robertson Co., Ltd., Montreal; H. Hick, Toronto; H. Flett, of Taylor Forbes Co., Ltd., Toronto; W. Chittenden, of Walworth Mfg. Co., Boston; W. Hazelton representing Twyfords, Ltd., Hanley, Staff., England; E. and Mrs. Coldrey, Ottawa; A. and Mrs. Langelier, Ottawa; Messrs. Pratt, Forrest and Backer, of James Robertson Co., Montreal; A. E. Gibbons, London; John Eggett, London; A. Gauthier, Ottawa; E. L. Wayman, representing Standard Ideal Co., Ltd., Port Hope; H. A. and Miss Knox, M. M. and Mrs. O'Connell, Mr. and Mrs. McIntyre, Ottawa; Mr. and Mrs. Darrow, Ottawa; A. H. and Mrs. Currie, Ottawa; Mr. and Mrs. Powers, Ottawa; Mr. and Mrs. Cole, Ottawa; E. A. and Mrs. Band, Ottawa; C. M. B. World, Ottawa; C. M. Shearer, of Thos. Robertson Co., Ltd., Montreal; F. W. Wall, of Mott Co., Ltd., Montreal; A. W. Gardner, of Steel and Radiation, Montreal; John Watson, Montreal; Jno. A. Gordon, Montreal; Mr. and Mrs. Livock, Ottawa; Edwin Newsome, representing The Sanitary Engineer, Toronto; W. Hickson, Toronto; C. M. Webb, representing Warden King, Ltd., Toronto; C. W. Clews, of Steel Company of Canada; R. H. Mueller, of Mueller Mfg. Co., Sarnia; D. A. Armstrong of Canadian Lamp and Stamping Co., Ford; C. P. Holloway, Ottawa.

Dr. Hodgetts, M. D., of the Conservation Commission, gave a splendid address and in response to the toast, "Our Country," he stated that up till recently Canada had been drawing too much upon her natural resources in such a way as to very soon lead to total depletion. We

had laid waste our forests; our farms had been devastated by men who took all out of the land and left it poor; our water powers had been laid waste; all of which made the country actually poorer. Our homes were becoming simply places to sleep in rather than to live in.

He referred to the valuable work that was being done by the sanitary and heating engineers. Sanitation was necessary to conserve the lives of the race. Sanitary engineers are intrusted with the installation of proper sanitary heating and ventilating engineering in our homes, for the proper disposal of our sewage, and for protecting our water supplies. Were it not for this work we could not exist very long. He said it was the sanitary engineers who got right down to the work of making the home sanitary and expressed the hope that they would study the problem of lighting as a sanitary measure. He touched upon the connecting link between the profession which the society represented and the branch of medical education under which he worked. He was of the opinion that every house that didn't have a bath should be condemned as unsanitary.

Mr. Blyth, of Ottawa, in replying to the toast of "Our Guests," spoke of the association as one which occupied a very responsible position. He spoke of the impossible task which the Panama Canal would have proven, had it not been for General Gorgas and the sanitary measures which he enforced in the Panama zone. The inhabitants of Manila were subjected to many diseases until sanitary engineering was brought into being there. In conclusion he voiced in very strong terms the necessity of sanitary and heating engineers becoming convinced of the responsibilities which were theirs.

Replying to the toast, both Mr. McKinley and Mr. Russell spoke. Both speakers appealed for more co-operation amongst the sanitary and heating engineers. The society is now coming into its own, and is getting on to a proper footing. G. S. Dorman, of New Brunswick, instanced the heating equipment of the Chateau Laurier as an example of the triumph of the science of modern heating. He claimed that the medical profession would be helpless without the sanitary engineer.

The president of the association, Mr. McKinley, proposed a toast to the "Technical Press," expressing his appreciation of the work of the press. Edwin Newsome, editor of The Sanitary Engineer, responded, stating that The Sanitary Engineer would always take the stand for

good sanitation. He assured the members that this paper would continue to preach the gospel of good practice and live business methods. He thanked the trade for the way in which they had supported The Sanitary Engineer. Wherever it could assist the craft the services of the paper were at their command. The Sanitary Engineer took up problems which were of a vital nature in every sense of the word to the sanitary and heating trade. He referred to his arrival in the country some ten years ago. He could see faces before him who were his fellow workmates for several years, and that he personally had to thank several of the members of the craft for the way they had treated him. As editor of their technical paper, the official organ of the sanitary heating and ventilating trade, he would do all in his power to advance the cause of the craft and in that way be preaching a vital gospel for humanity at large.

The Menu.

Canapes of Caviar	Clear Green Turtle
	Fillet of Sole Dieppoise
	Fresh Mushrooms on Toast
	Roast Rack of Lamb
	Petits Pois au Beurre
	Potatoes Parisienne.
	Broiled Breast of Chicken
Alexandra Salad	Fancy Ice Cream
Assorted Cakes	Coffee

The entertainment part of the evening was provided by Gordon Rogers.

NOTES OF THE OTTAWA CONVENTION.

The reception and entertainment of the delegates and visitors were undertaken by the local Ottawa Association, who named the following to act as Reception and Entertainment Committee: A. H. Currie, M. M. O'Connell, A. Gauthier, E. A. Band, C. P. Holloway.

The Entertainment Committee desire to express their warmest thanks to the following manufacturing firms and supply houses who generously assisted the committee: Mott Co., Ltd., Jas. Robertson Co., Ltd., Gurney Massey Co., Ltd., Warden King, Ltd., Standard Sanitary Mfg. Co., Taylor Forbes Ltd., Dominion Radiator Co., Ltd., Twyfords, Ltd., Canadian Brass Co., Steel Co. of Canada, Gurney Foundry, Toronto, United Brass and Lead Co., Ltd., Canada Metal Co., Steel and Radiation Ltd., Waldon Co., Ltd., Cluff Bros., Fittings Ltd., W. R. Cuthbert & Co., Page Hersey Co., Standard Ideal Co., Ltd., Canadian Wolverine Co., Good Mfg. Co., Jenkins Bros., J. Watterson & Co., Empire Mfg. Co., Ltd., Thos. Robertson Co., Ltd.

A Petition Re Bulk Contracts

Being a Petition Presented to the Hon. Robert Rogers, Minister of Public Works, Ottawa, by a Delegation Appointed by the Canadian Society of Domestic Sanitary and Heating Engineers When in Convention at Ottawa, June 9-10-11, 1914.*

To The Hon. Robert Rogers,
Minister of Public Works.
Ottawa.

Ottawa, June 11, 1914.

Honored Sir,—The following petition drafted by the Canadian Society of Domestic, Sanitary and Heating Engineers, now in convention assembled at Ottawa, is herewith presented for your favorable consideration.

That Whereas, it is now the practice of the Department of Public Works to allow contracts in bulk for the various Government Buildings constructed by the Department of Public Works throughout the Dominion;

And Whereas, it is expressly a condition of each contract that no portion of the contract is to be sub-let;

And Whereas, the majority of bulk contractors are men who have no individual acquaintance with or training as Engineers in the mechanical equipment portion of the contract;

And Whereas, under these conditions they are compelled to seek tenders from Engineers for the mechanical equipment, and in spite of the restriction against sub-letting, invariably do sub-let this portion of the work;

And Whereas, the installation of mechanical equipment would be better facilitated by direct contract between the Government Engineers and the mechanical equipment contractors if no intermediary bulk contractor stood in the way;

And Whereas, it was never the intention of the Department that a percentage should be paid to the bulk contractor over and above a legitimate price made to the bulk contractor by the mechanical equipment contractor and which percentage is invariably added by the bulk contractor;

And Whereas, through direct dealing by the Department with a mechanical equipment contractor who would, under the Department Regulations, have to deposit a percentage of his tender with the Department, only responsible Engineers would be in a position to undertake the mechanical equipment, and in consequence, greater conformity to Government specifications could be secured with less friction and trouble to the Public Works Department.

YOUR PETITIONERS DO HUMBLY PRAY, That in all Government works where the value of mechanical equipment is over the sum of One Thousand Dollars, separate tenders be called for the mechanical equipment. Mechanical equipment consisting of Plumbing, Heating, Ventilation, Sprinkler Work and Vacuum Cleaning installations and Electrical equipment.

We are, Honored Sir,

Your Humble Servants,

C. S. DORMAN, President,

W. C. CRAWFORD, Secretary,

J. T. BLYTH, Chairman,

Legislative Committee.

*Delegation who presented petition comprised of the following gentlemen: Messrs. Dorman, McKinley, Russell, Godwin, Farrell, Blyth, Hicks, Fullerton, Shannon, Gardner, Gibbons, Frankland and World.

What Good Points Has This Boiler?

There are some very sound reasons why you should recommend the

GURNEY SMOKE - CONSUMING BOILER

Briefly here they are:

Power plants must burn slack. Anthracite costs too much. This is the first boiler to successfully burn soft coal slack and obtain the same results, ton for ton, as from hard coal. We have proved by repeated tests that this boiler cuts fuel bills in half.

This boiler burns its own smoke. Instead of passing up the chimney to waste, the smoke and gases pass over the fire box and are consumed. (See illustration on opposite page.) This accomplishes two things: it greatly increases the heating power of this boiler and it eliminates the "smoke nuisance."

It is important that the Heating Plants you install should be in every way satisfactory. It helps *your* business. So recommend the Gurney Smoke-Consuming Boiler for either steam or hot water heating because it is the "last word" in fuel economy: it burns its own smoke absolutely: it is as simple to operate as an anthracite-burning boiler: it is easily cleaned and the damper regulation is automatic.

It is built in sections that easily pass through a 24" door: it is convenient to install.

It is in every way as efficient as an anthracite-burning boiler and twice as economical.

This Boiler Burns Its Own Smoke.



The Gurney Foundry Co., Limited

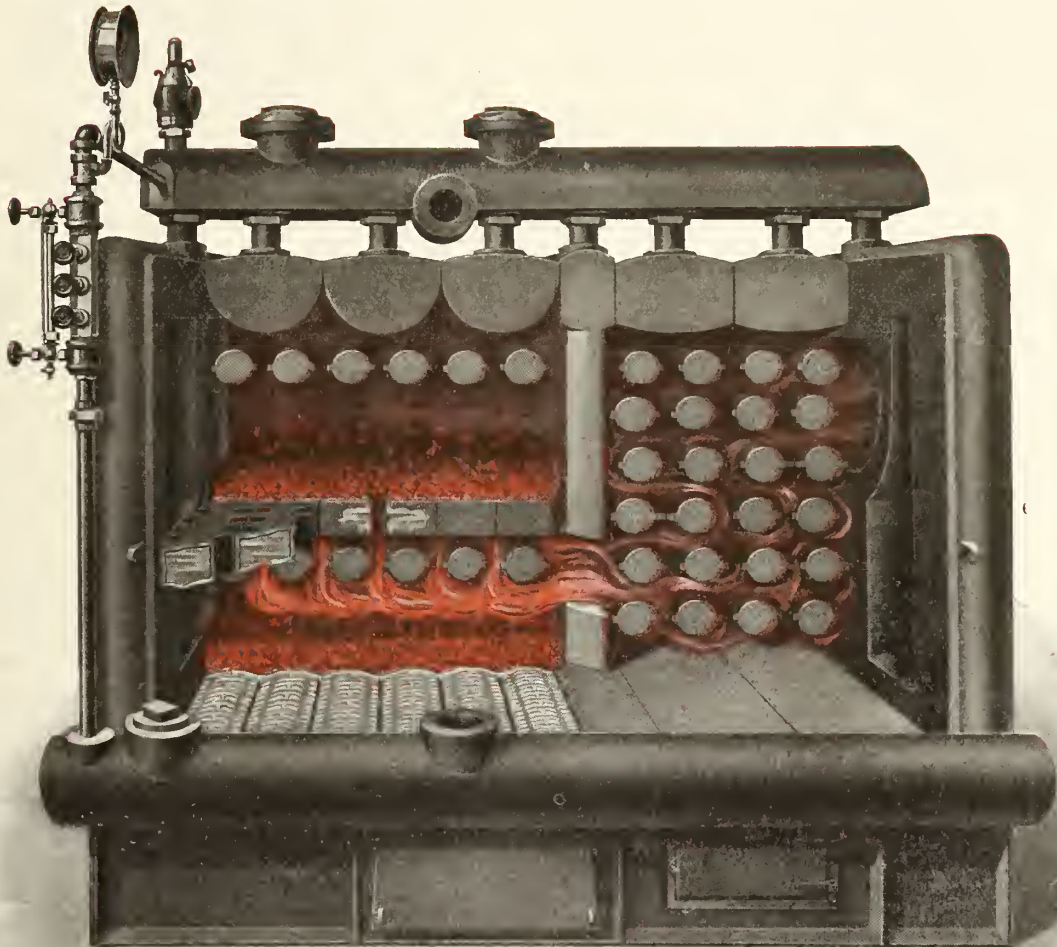
ESTABLISHED 1843

Toronto

AND
EVERYWHERE
IN

Canada

A Smoke-Burning Boiler at a Reasonable Price



This illustration shows the construction of the GURNEY SMOKE-CONSUMING BOILER, its tremendous heating surface and the way we have solved the smoke-burning problem.

Write for copy of booklet called "A Sharp Cut in the Cost of Fuel" which further describes and illustrates this Boiler.

The Gurney Foundry Co., Limited

ESTABLISHED 1843

Toronto

AND
EVERYWHERE
IN

Canada



"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription Canada, \$1.00 per year.
United States, \$1.50, Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, Toronto Atabek, London, Eng.

John Bayne MacLean, - *President*

J. G. Lorrinan, - - - *Manager*

Edwin Newsome, - - - *Editor*

Circulating amongst Sanitary, Heating and Ventilating Engineers, Gas Fitters, Sanitary Inspectors, City Engineers, Boards of Health Architects, etc.

TORONTO, JUNE 15, 1914

THE OTTAWA CONVENTION.

A GAIN we are looking back at another convention and in so doing we are recalling all the events which took place. Conventions are held to review the year's work just past and prepare plans for the coming year, and in reading over the reports submitted from various parts of the Dominion one could see that much had been done in more ways than one. As a whole this convention just over will be marked as one never to be forgotten, splendid plans were laid out for the year's work and some of the most earnest workers in the society were elected officers.



QUESTION OF OVERHEAD EXPENSES.

THE question of overhead expenses was taken up in a very fine paper by L. LeGrow, of Toronto. In this paper he pointed out in comprehensive manner the difference between adding to buying prices and selling prices. Mr. LeGrow stated in part that if a person bought a shipment of supplies for a given price, that price was not by any means the cost price. The cost price, in actual fact, is the selling price. In other words, in buying goods every overhead, or shall we say fixed charges should be added to the price of the goods before the actual cost is arrived at. This article by Mr. LeGrow will be seen on another page of this issue. Before closing this topic let us state that if any of our readers will send us in any questions on the matter we will only be too pleased to go into their questions and in that way bring down actual examples for the benefit of all concerned.



THE EVILS OF PRICE-CUTTING.

WHEN business slows up and prospects do not look any too good for the immediate future, there is often a tendency on the part of some manufacturers, jobbers and retailers to resort to price-cutting, the result being that prices are cut to the limit and business is demoralized. This is particularly true of retailers in some parts of this country and is a dangerous way of attempting to stimulate business. Every retailer should stand up for a legitimate profit.

A firm resolve not to cut price, but to maintain an equitable standard, based on cost would indeed be a good resolution to abide by. Make a price that carries a legitimate profit and do not be afraid to stand up for your profits. One of the greatest evils of to-day is that retail hardwaremen in many instances, are trying to undersell each other. Conditions of this kind should not exist. Price-cutting is bad business.

One of our greatest troubles has been our misunderstanding of the word "competition." It has occurred to a few that the word could mean something else besides "price"—that there could be such a thing as competition in service, in quality, in suggestion, in originality; but to the great body of merchants, both large and small, it has meant only "price."

Someone once said that competition was the life of trade. He should have said that a common-sense, co-operative competition, is the life of trade, or a mighty good stimulant, but that a riotous and haphazard competition is the death of business.

There are too many men who do not know their own business, and singularly enough, they do not seem to realize this important fact. A man may know one side of a business and yet be unfamiliar with another side. He ought to be able to turn his business inside out and see what is inside as well as being able to look clear through it—or in other words, know it from its tap roots to its top-most branches.

If hardwaremen only knew each other better, "and knew where to get off," business life would be made much easier and profits would accrue more rapidly. How much better it is to work together than single-handed. Think of the hundreds of carloads of nails, wire, cement, etc., that are handled yearly by some hardwaremen at practically little or no profit. Think of the hundreds of lines that have been placed on the market during recent years—lines of goods which have been produced to sell at a reasonable price,—allowing the retailer a legitimate profit, and which after being on the market a few months have been cut-priced to the limit, by some retailer who for some unaccountable reason has cut the price and demoral-

ized trade in these lines in his district. Retail hardwaremen should try to understand each other better. Too many things are taken for granted, and too many guesses are masqueraded around as facts.



SANITARY ENGINEERS ON HEALTH BOARD.

THIS matter was taken up very strongly at the convention just over and we hope to see much good come of the action taken. It was urged that the trade should make strong appeals to the various councils when boards of health are being formed to see to it that every city, town or village have at least one member of the trade on that board. We are pleased to hear that several cities have succeeded in getting a member on the board and hope that when next the members meet in convention, many more will have been added to the list.



SET UP A NEW STANDARD.

AT this time when business as a whole throughout Canada is not quite as brisk as it might be, it would be well for each and every member of the trade to look around, give a little more time to study, ask oneself this question: "Am I getting value out of my business for the amount of energy I put into it?" and according to the answer take action. Under existing circumstances it may be said that sanitary engineers are the greatest philanthropists on this earth. Ninety per cent. are not making as much for themselves as if they were employed by some other company, drawing a regular salary; and why? Simply because they have not taken up the question of the cost of doing business. Now as we stated before, here is the time to set up a new standard and take stock. Put a value on that stock and include in your assets your abilities. Then make a charge for those abilities. In speaking to one of the Ottawa members upon this subject the following words were said: "No sir, I've been working for the public too long. Do you know at one time I was run off my feet, had to buy an auto, and was employing 40 to 50 men steady, and at the end of the year I was actually in debt. But to-day I'm not employing more than 16 to 20, and can boast of a fair bank account. Every dollar I turn over brings its profit and I know it. Further, I have an easy mind, and when I send in a certain quotation, that's my price, and if my tender is accepted I make money on it. If not, I don't lose on the job, because I don't take it."



THE TRADE PRESS AS AN EDUCATOR.

IF the Dominion Government adopts the recommendations of the Royal Commission on Industrial Training and Industrial Education, and many believe it should do so, Canada will spend \$3,350,000 annually to aid technical instruction and training, \$3,000,000 of which will go to supplement local efforts in providing vocational training for those who are past school age. Prof. W. J. Robertson, the chairman of the Commission, believes that national progress is dependent solely upon the efficiency of individuals, men and women. What is required, he contends, is that the individual worker shall possess **intelligence, practical ability and co-operating good-will**, and these essentials are not inherited, but must be acquired by educational and technical training.

The work which the Dominion Government proposes to do through the establishment and maintenance of techni-

cal schools and by means of pre-vocational training will be a worthy complement to and recognition of the educational and inspirational work which the trade and technical press has been doing persistently and systematically for over thirty years. The publishers of trade and technical publications have no desire to pose as public benefactors entitled to subsidies, but it is an incontrovertible fact that they have done, and are doing, a great deal to advance the progress of Canada by enunciating and teaching the principle laid down by Prof. Robertson, as being essential to individual efficiency, and, therefore, upon which the greatness of the nation depends.

Intelligence, practical ability, co-operating good-will—these three have been for more than a quarter of a century the foundation-stones of the educational policy of the trade and technical press. It has taught men to think for themselves; it has roused their latent capabilities into action; it has made practical knowledge of and ability in one's business all-important essentials, and has helped men to acquire them by teaching advanced methods of manufacturing and selling, improved credit systems, and a proper appreciation of the place and power of modern advertising; it has been the inspirer and the leader in practically every co-operative movement having as its object the interchange of craft knowledge and the betterment of conditions. The trade press has served as the medium through which men have learned all the news of particular interest to themselves. A trade or technical paper is the only newspaper which supplies news one-hundred per cent. interesting to its readers. In a word, the trade and technical press has taught men that all real, lasting success, both as an individual and a business man, must be based upon **Service**, the fundamental of all honest, modern business.

It is inconceivable that the Government of Canada, which has already declared itself as realizing the importance of the work of industrial and technical education, can consistently permit its officials to put any obstacle in the way of a class of newspapers that are aiding to a very appreciable degree the accomplishment of that same work. There are a host of excellent reasons for maintaining the trade and technical press on the same basis as other legitimate newspaper enterprises, in the matter of postal rates and regulations, notwithstanding the personal prejudices of a few individual interests.



MEDICAL HEALTH OFFICE AND SANITARY ENGINEERS.

THIS was a subject which came up for discussion not particularly at the convention, but rather amongst the various members of the craft. In almost every province there are towns or cities where the councils are anxious to place the sanitary engineering department under the jurisdiction of the building inspector, architect's department or under the city engineer. The medical officers of health are in some cases very indifferent. Some actually indorse such a course, while others will not listen to such a course. Now the position which Sanitary Engineer takes is this, and always has been that sanitary engineering should be under the jurisdiction of the Board of Health. It should be and is in actual fact the engineering department of the medical health office. The medical officer of health should be the one to hold sway in such a matter, and no other course should be tolerated for one moment,

A Discussion on Overhead Expenses

Showing How Sanitary Engineers Should Take Note of Their Overhead Expenses, and Define the Difference Between Actual Profits and the Real Cost of Doing Business.

By Lewis LeGrow, Sanitary Engineer, Toronto.

THE man who periodically blows off in the exhaust pipe about living Nye to Die, states that money never yet has bought as good a time as a small boy can have with a crooked stick, a fish line and a can of worms. (I like these sentiments) and I will suppose that the boy would soon lose his happiness if after fishing for sometime he caught no fish. (Natural, isn't it?)

Well here we are — grown-up boys, spending and being spent, laying waste our store, troubling ourselves about others when properly the trouble lies in us. Getting and spending, worrying and being worried, optimistic and pessimistic, thinking that progressive business methods require us to secure every job that comes on the board, at a profit if we can, below cost, if we must, in order to compete and beat out our fellow craftsmen. Why is it that in our business we do not seem to discover the minimum at which we can profitably work? Do we take so much money for a little while and have it properly charged to our private account, or maybe we take the smaller amounts from our business continually and not keeping account of it so that at the end of our financial year we know how much money we owe and are owed but for the life of us we do not know how much money we have spent.

Gather around now, fellow sanitary engineers, and let us have a little chat about facts. Understand the easiest thing to do is to roll down a hill, but in order to roll down you must climb up. Now are you down or up? If you are down the only way up is to start going and when you get up to the top stay there.

Now for the start—We are going to spend \$1.00 this way:—

Rent	2c
Telephone and insurance	1½c.
Printing, postage, stationery, car tickets, light	1½c.
Repairs and replacing tools, cartage, defective material and breakages	1c.
Losses on bad and discount accounts in order to make settlement	1c
Bookkeeper's salary	4c.
Proprietor's salary	8c.
Materials purchased	55c.
Wages purchased	28c.
	<u>\$1.00</u>

Now watch us very closely, the spending of it may deceive us. We spent \$1.00 fairly accurately and very economically. We may have charged something for the

\$1.00, while it was around working for us, or we may have loaned it on mortgage and received 5c. for it, but we did not do so bad; we did not hide it and feel afraid that it would be lost.

But do not forget that \$1.00 which we are talking about. One year has passed, and we are elated over the number of dollars we turned over, and now having

Rent	\$ 300.00
Telephone	50.00
Insurance	15.00
Printing, postage and stationery	40.00
Car tickets	25.00
Light	12.00
Cartage	75.00
Repairs of tools, and replacing worn tools	50.00
Losses on bad accounts and credits given to settle accounts ..	100.00
Cost of material and time to replace bad material	50.00
Salary bookkeeper	600.00
Salary proprietor	1,200.00
Miscellaneous	33.00
	<u>\$2,550.00</u>



Lewis LeGrow, Toronto.

Our merchandise purchases in order to do this \$15,000 worth of business Amounted to\$11,000

Wages purchases 4,000
\$15,000

What it has cost us in uncontrollable expenditure in order to do this amount of business:

Now you will notice that this is equal to 17c on the dollar of \$1,500, so that for every dollar we pay in merchandise purchases and wage purchases it has cost us 17c. in order to buy this merchandise and wages, and sell them again. Now then suppose that we have a contract where the material and wages will cost \$150. In order to pay our overhead expenses it is necessary to add 17 per cent. to the \$150, which equals \$25.50. Now then, suppose we would like a small profit on this amount of \$175.50 in order to create a capital in our business, and to have some remuneration for our time and worry outside of the dear salary that we have.

Let us add on a nominal sum of 10% on to \$175.50, which makes \$175.50 or a total of \$193. So you can readily see that in order to make a profit out of your \$150 job it is necessary to add on the 17 per cent. on the amount of \$150, plus 10% which is very small profit for doing work.

Now it does not matter what method we adopt in order to find out overhead expenses. It is not necessary that we should employ an auditor and have an elaborate system of checking. Any one of us can write on a piece of paper what our overhead expenses are, and if we recognize the fact that we intend to stay in business and have a fair profit or a small profit on the amount of business that we do we must put on a profit over and above our overhead expenses, and the simpler the method we use the more success we likely will have.

taken stock we find that we have done a business last year of \$15,000. Not so bad for the average sanitarium. Let us try and find how it works out.

Advertising as Applied to Sanitary Engineering

Showing What is Being Done to Assist Sanitary Engineers Improve Their Business—Advertising Has Received Very Little Attention by the Craft, Therefore This Article Should be of Very Great Interest.

By C. B. Nash, Pittsburg, Pa.

HOW the plumber can take advantage of the trade helps and advertising service of manufacturers of nationally advertised goods is dealt with in the course of a very interesting lecture prepared by C. B. Nash, of Pittsburg, Pa. This lecture is one of a series published by the National Educational Committee of the Associated Advertising Clubs of America and furnished to advertising clubs all over the continent. It is entitled "Retail Advertising." The members of the Montreal Publicity Club recently listened with a great deal of attention to the arguments advanced by Mr. Nash for retailers to accept the proffered aid of manufacturers. There are, of course, many manufacturers turning out good goods who do not have the elaborate system of trade helps to which Mr. Nash refers, but some of his thoughts and suggestions may be of value to members of the craft, and we quote some portions that apply particularly to plumbers. Mr. Nash says:

"It would be interesting to learn just how much advertising efficiency is lost each year through the inability of retailers and manufacturers of nationally advertised goods to get closer together on advertising and sales problems. The attitude of the national advertiser is to get and keep in as close touch as possible with the dealer who can or does act as his distributor to the consumer.

How to help dealers increase their sales is the problem that is more than ever engaging the attention of national advertisers, and how to get dealers to accept proffered aid is in itself a task.

Many national advertisers whose goods reach the consumer through the retail dealer, maintain trade aid departments, the sole object of which is to help dealers with their advertising. It can safely be said that few such departments have reached a very high state of efficiency because few dealers realize the great and growing value of such service. Then, too, there is a hitch very often when the dealer does not want the national advertiser to mention his goods specifically in advertisements prepared for the dealer's use. This privilege removed, the national advertiser's incentive is likewise removed.

In many lines national advertisers are prepared to extend, all the year around,

help to retail dealers handling their goods. They are prepared to make their advertising and publicity departments clearing houses on all dealers' promotion subjects. To them, dealers can turn for advice and help on matters foreign to advertising, and there is no question but that in many instances dealers who bend their advertising efforts to conform with those of national advertisers, are favored in many directions when the opportunity arises.

The extent of this trade and service varies greatly in different lines, but broadly speaking it embraces every phase of advertising.

I may be pardoned for here speaking specifically of the line which I know so well, and using it as an example. A prominent sanitary manufacturing company maintains as a part of its general advertising department, a trade-aid department for sanitary engineers. It is prepared to help sanitary engineers advertise in newspapers, street cars, programmes, motion picture theatres, and is likewise prepared to help in the matter of show windows and showrooms, fairs and local displays, and by furnishing imprinted literature to be handed or mailed to prospects.

Let us take the case of a sanitary engineer who wishes to take advantage of all this trade-aid service that is possible to apply profitably to his business.

In the first place the company makes a study of the sanitary engineer in order to obtain a good idea of the local conditions under which he is working. If satisfied by this investigation that there is good prospect for success, co-operation is extended along the lines that appear most advantageous. If, on the other hand it appears as though local conditions are not right and any advertising done would have to battle with too many handicaps, with the chances in favor of failure, the service is not started until such conditions have been improved sufficiently.

Short time advertisers are not desired, and at the start the sanitary engineer is impressed with the importance of continuous advertising. Those who wish to advertise only spasmodically are advised to wait until they are prepared to go into it at sufficient length to give it a chance to make good.

On account of the bulk and large

variety of plumbing and sanitary fixtures, it is impossible for any sanitary engineer to carry a complete stock, but before starting the advertising an endeavor is made to have him display a sufficient number of samples to show the extent, quality and character of fixtures advertised. The larger, more complete and artistically arranged his showroom is, the better advertising foundation it offers. The showroom, however, large or small, is supplemented with the company's catalogue showing the complete line of goods manufactured, together with full information about it.

Our sanitary engineer is now ready—for example—to take up newspaper advertising. He is forwarded an agreement blank to be filled in and signed. The purpose of this blank is to gather circulation information about the paper or papers in which he intends to advertise, together with rates, schedule of insertions, size of advertisement, and other information necessary to assure intelligent co-operation upon the part of the trade-aid department. Small advertisements at regular periods are encouraged in preference to large advertisements at infrequent intervals. When the sanitary engineer wishes to run large advertisements, he is encouraged to start with small ones and increase the size according to results secured.

If the newspaper advertising agreement covers—say a period of one year, the agreement fixes the dates of insertions and thenceforth the trade-aid department assumes responsibility for furnishing a complete advertisement for every insertion specified, and the sanitary engineer is relieved of the work and expense of preparing copy and securing plates.

Copy is always sent in plate form and the sanitary engineer is furnished with a proof to make sure that the advertisement is satisfactory to him. In some cases copy is sent direct to the newspaper when the sanitary engineer so directs, and his advertisements are prepared with the same care and thoroughness as are the company's own advertisements.

Now suppose that our sanitary engineer wished to take up street car advertising. The same general preparations are made, and the sanitary engi-

(Continued on page 33.)

Looking Back at the Plumbing Trade

Showing How We Used to do Things in Years Gone By and Now
—How a Chap Would Think it a Crime to Show His Mate How
to do a Job or Two for Fear of Him Getting Too Wise.

By "One of Us."

I T don't seem long ago since a fellow use to dope up his own wiping soldier "to suit his'sel," when the wiping of a good joint was something of a victory and the helper would look on with awe not unmixed with a wee bit fear as to whether the joint was going to be tight or full of blow holes, and when a fellow would pour ladles after ladles full of metal over the joint, then "cuss some," because the stuff wasn't workin' proper, when four or five wipe joints counted a day's work. But say, they were joints though, in them days. I took a squint over a pile of scrap lead from an old job that had been torn out of a building, and I simply felt I'd like to peddle a few of them joints round to some of the jobs I go to look at now and again, and show the lads what kind o' joints were made in the days of long ago. They were simply a sight for sore eyes. In them days every boss cud wipe, and when a fellow made a joint like as if it had got a swelling on one side or if it looked more like a bulge on a camel's back, the boss would do some Indian war dance right there on the job, and make the chap that wiped it feel like a cent. It sometimes happened to me and I used to feel like a "meg." That was in England of course. We called cents megs over there. Another thing which used to nettle the "gaffer" in them days was when we made the joints too heavy. He'd get rattled and ask who paid for the "sother." We call it "sorder" here, and we're both wrong. It's S-O-L-D-E-R, solder,

Well, talking about big joints, some fellows say: "I like to see a good sized joint. There's less chance of a leak and if it does 'sweat' a bit you can knock it till it's tight." Now talking like that's like reading out of a book with all the leaves torn out and the back lost off it. The fellow that can't make a joint, thick or thin, that don't sweat, should be sweating himself at the end of a pick.

Then again, other fellows will say they like a small long joint "because it looks neater." But say, has it ever struck such fellows that wiped joints are neither made to "sweat" nor to "look at." They're made to stand the test of hard work and time. Now I'd like some of the fellows who read this

to send in a letter to the editor of Sanitary Engineer some time and give him their idea what style of a joint is best and I know he'd be tickled to death to print it. The reason I started gassing about wipe joints was, I read that article which a fellow called Haslett wrote and then I took a look at some joints which the lads had made, and the more I look at 'em the more I feel he must a' swiped a few off an old job an' had 'em fotygraft. There's certainly "some joints" shown on that picture. I didn't see one joint that looked as if it had the hump and if Haslett shows the lads how to make joints like that, he's going to save tons of "sorder" fer the boss and better jobs fer the customer. But what's the use of thick joints anyway, so long as you're joint is as thick as the walls of the pipe? That's all that's wanted. It doesn't matter what kind of pipe, if it's waste pipe. Let the joint be made with as much thickness of solder as the pipe. Can you show me why it should be should be thicker? Why look at the time when overcast joints were made on waste pipe. Not that I'm favoring such joints, but they stood up and these facts can be proved by the amount that's seen when taken out of old jobs. "Oh yes," I can hear some chaps say, "but they didn't put the water test on jobs in them days." That may be, but just for fun get a piece of lead waste pipe, make a good overcast joint, sorder it up and put a pressure gauge on and turn on the hose. Then seen what pressure it will stand.

I'd like to know how many has ever tried it. Why, a fellow don't need to even take that trouble. Just look at the measly way the cap is sordered on a lead bend to put the water test on, and then talk about it being necessary to make heavy wiped joints. Another thing besides wasting sorder, it wastes time, and time costs money these days. But when yer waste both time and sorder it's no wonder the boss gets "up in the air." Now, Mr. Editor, if you think fit to print this bit talk, all right. The reason I couldn't help but write it was I'd been looking at the picture of them joints made by the lads in London, Ontario, and they're "some joints," believe me."

ADVERTISING AS APPLIED TO SANITARY ENGINEERING.

(Continued from page 32.)

neer is furnished with the required number of cards for each month's insertion. As a rule, arrangements are made to send the cards direct to the street car company for insertion, thus relieving the sanitary engineer of the trouble of handling them. Additional cards are at the same time sent to the sanitary engineer when requested, for use in his show window or store, and some sanitary engineers make it a practice to post the same card concurrently in hotels, barber shops and other public places.

As a rule, these cards are printed in four colors, or even more, and are very high class. To secure cards that even approximated these in beauty would be practically prohibitive to the sanitary engineer on account of their cost.

If our sanitary engineer now desires to show slides in local motion pictures, he can obtain his slides in a similar manner. An agreement is entered into covering the number of theatres in which he intends to advertise, and how often they are to be changed. Slides are sent in accordance with this agreement for the length of time specified.

The work goes on into many directions according as the sanitary engineer allows the trade-aid department to help him. He is furnished with special advertising matter for local fairs and exhibitions, with schemes and banners for floats, etc. In fact he regulates the benefits to be reaped from the trade-aid department in proportion to the opportunity extended to it, and exactly the same condition is true in other lines. I am sure that many local advertisers would experience an awakening if they would take advantage of all the help that awaits them. The kind of help differs according to the lines of business and conditions, but there are many national advertisers who are waiting to extend the most thorough and competent trade-aid service, but who are not given the opportunity. I confidently believe that the wave of advertising study, which is rapidly extending throughout the country, will bring retail advertisers to a quick and full realization of the value of co-operating with the advertisers of nationally known goods."

Problems in Sheet Metal Work

By E. Bronson.

IN the problem presented here we show a three-pieced tapered elbow, with all the taper in the centre section. This makes a neat elbow, and has several good points, such as not requiring as much height as an ordinary tapered elbow. Both ends being straight, they make a better joint with other pipes than when tapered, with the further advantage that the pattern of the centre-piece only need be developed, as the two end pieces are made with the regular three-piece pattern.

In elevation Fig. 1 we show a three-piece elbow. To lay out same proceed as follows:—Erect on a line, say A-B, one section of a three-pieced elbow, as shown by A, B, C, D, the diameter of which is the large end of the required elbow. At right angles to B-D mark line as E-F, on which line erect E, F, G, H, being one section of a three-pieced elbow, the diameter being the size of the small end of required elbow.

Connect points C-G and D-E, completing elevation of elbow.

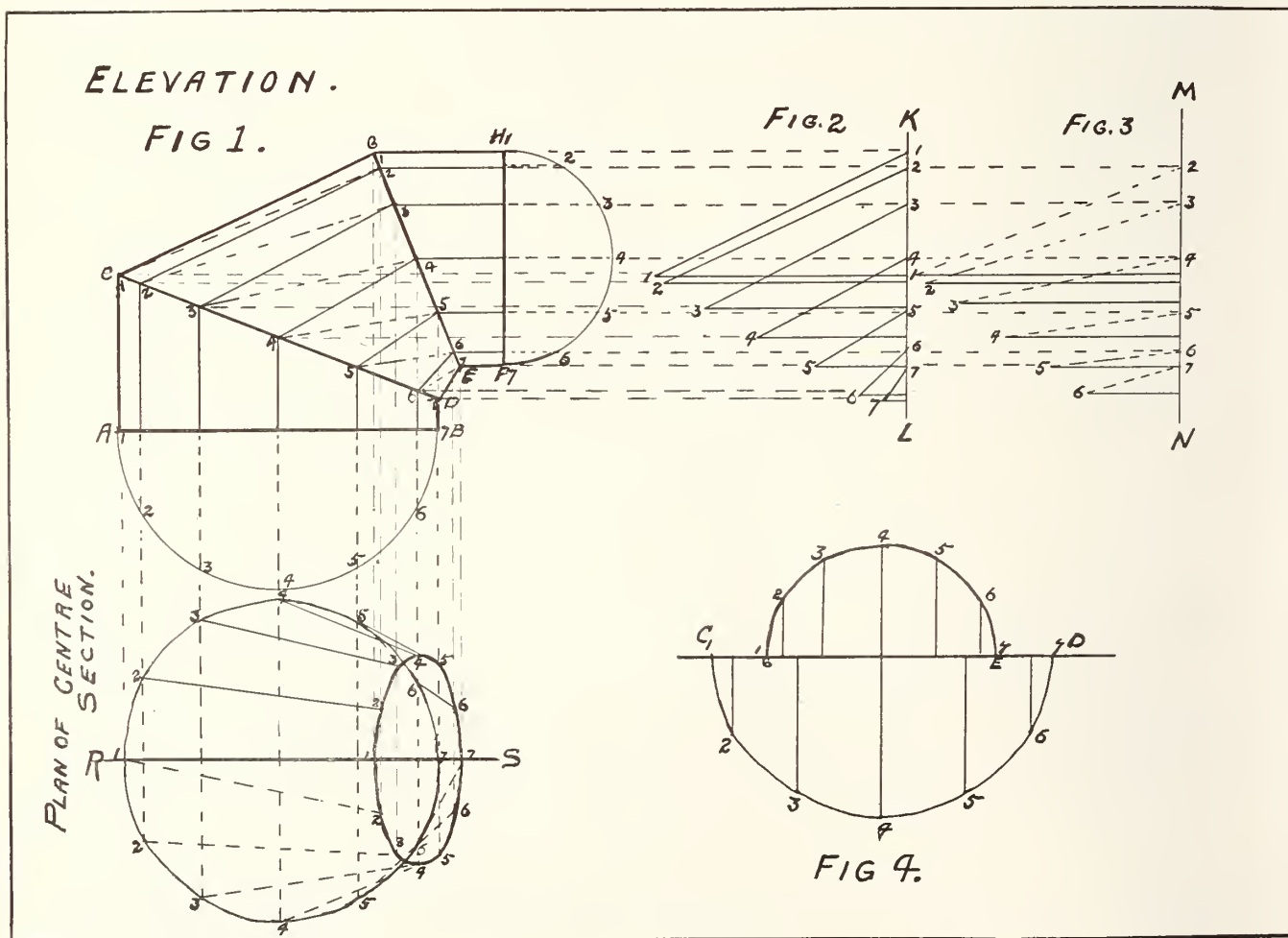
On the base lines A-B and F-H draw a half circle, and divide into an equal number of parts as shown by 1, 2, 3, 4, 5, 6, 7. From the points thus obtained draw lines at right angles to the base lines and continue them on until they meet the mitre lines C-D and G-E. Continue these lines across centre section connecting point 2 on C-D to point 2 on G-E, 3 to 3, etc. Connect point 1 on mitre line C-D to point 2 on G-E, with dotted or broken lines, point 2 to point 3, 3 to 4, 4 to 5, 5 to 6, and 6 to 7.

The next step is to lay out the height of the different triangles. Parallel with H-F draw two lines as K-L and M-N. From the different points on mitre lines C-D and G-E draw lines parallel to A-B until they meet lines K-L and M-N, the points marked by solid lines being marked on line K-L and the points marked by broken lines on line M-N. This gives us the height and the base line of the triangle, but we have yet to obtain the measurement of the base lines.

To get these we must first make a plan of section C-G-D-E. Then draw a line as shown at R-S, parallel to A-B, extend centre line 4-4 from A-B until it meets line R-S; with this point as a centre draw a circle of the diameter of A-B.

At right angles to R-S draw lines from points 1, 2, 3, 4, 5, 6, 7 on mitre line G-E, then with the compasses mark out on these lines from R-S the distance from H-F to the points in half circle, the distance from H-F to point 2 being placed on line drawn from point 2 on mitre line G-E, H-F 3 on line from point 3, H-F 4 on line from point 4, H-F 5 on line from point 5, H-F 6 on line from point 6. H-F 1 and 7 centre-lines in plan are on line R-S; a line drawn through the points thus obtained completes plan of centre section C-D, G-E.

On the plan draw solid lines connecting points 1 to 1, 2 to 2, 3 to 3, 4 to 4, 5 to 5, 6 to 6, 7 to 7, the distance from point to point being the base of triangles formed by solid lines on elevation.



With the compasses take distance from points 1 to 1 on plan and mark out from K-L on the line drawn from point 1 on mitre line C-D. Draw a line from point thus obtained to point on K-L drawn from 1 on mitre line G-E. The distance between these two points is the exact length on pattern between points 1-1 of the centre section. Take distance 2-2 on plan and mark out from K-L on the line from point 2 on mitre line C-D. A line drawn from this point to point 2 drawn from mitre line 2 E gives distance between points 2-2 of centre section. Proceed with points 3-3, 4-4, 5-5, 6-6, 7-7 in the same manner.

On the plan draw dotted lines connecting point 1 of large diameter to point 2 of small diameter, 2 to 3, 3 to 4, 4-5, 5-6, 6 to 7. With the compasses take distance from point 1 to point 2 marked by dotted lines, and mark out from M-N on line drawn from point 1 of mitre line C-D. Draw line from point thus obtained to point 2 M-N drawn from mitre line G-E. This gives the exact length between point 1 on C-D to point 2 on G-E. Repeat with 2-3, 3-4, 4-5, 5-6, 6-7, the triangles formed by lines on M-N being the ones formed on dotted lines on elevation.

In Figs. 3 and 4 we have the distance between the two lines C-D and G-E, but before we can draw the pattern we need the shape of elbow on the mitre lines C-D and G-E, in order to get the proper circumference of them on these points. To obtain these proceed by taking a

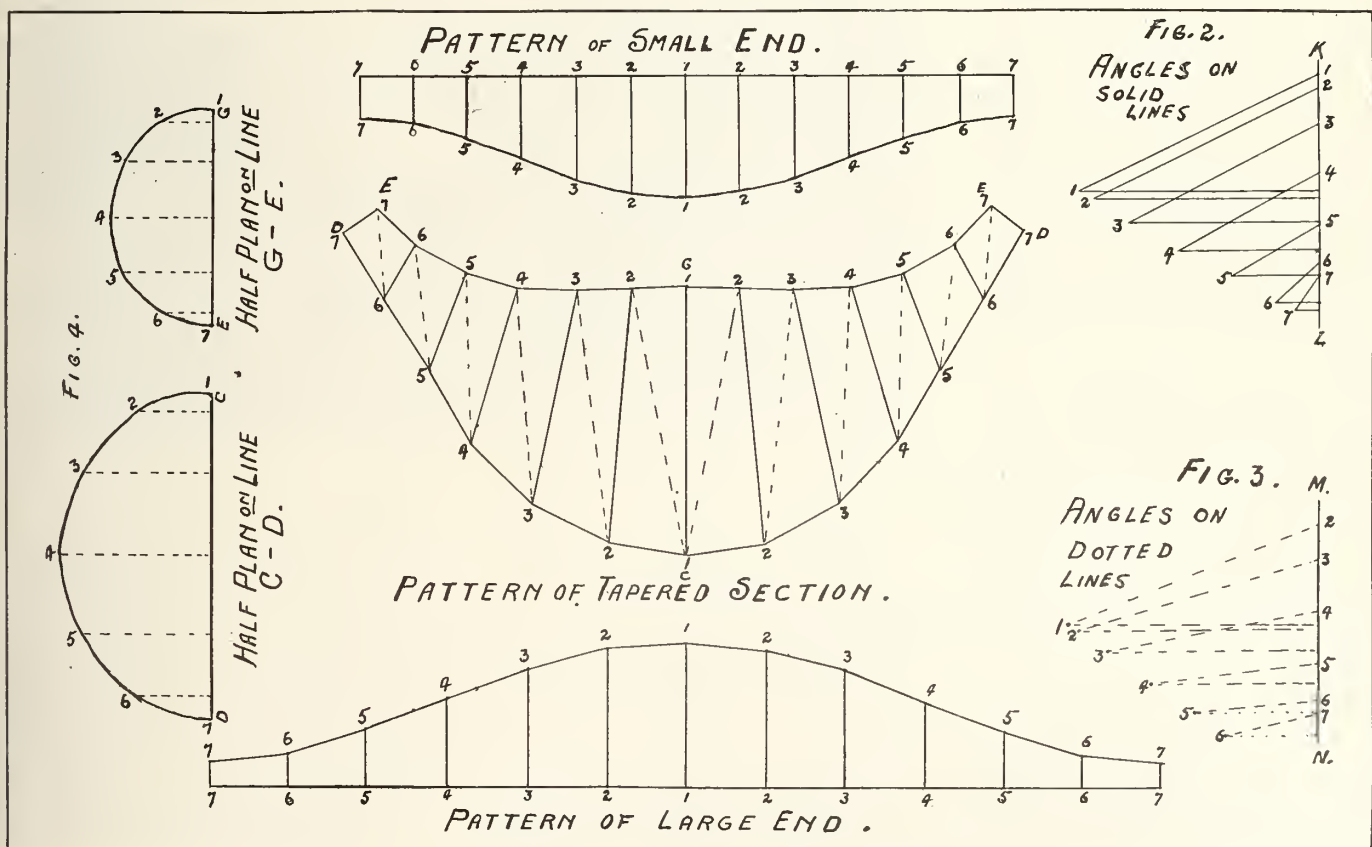
line as C-D on Fig. 4, on which mark the space between 1-2, 2 to 3, 3 to 4, 4 to 5, 5 to 6, 6 to 7 on the mitre line C-D. From these points draw lines at right angles to C-D. On these lines, 1, 2, 3, 4, 5, 6, 7, mark out from C-D the distance from line A-B in elevation to points in half circle, point A in elevation being point C in Fig. 4, from line A-B to point 2 being placed from line C-D on line 2. Repeat with other points. A line drawn through the points thus obtained in Fig. 4 gives a one-half profile or shape of elbow on line C-D. Proceed in a similar manner. The spaces between 1, 2, 3, 4, 5, 6, 7 on profiles in Fig. 4 give the circumference on the lines C-D and G-E.

The two end pieces can be developed in the regular way from elevation. For the pattern of the centre section, proceed as follows on a line as shown, mark off a distance equal to 1-1 in Fig. 2, with the compasses take the distance point 1 to 2 in Fig. 3, and with 1-C of pattern as a centre, strike an arc near point 1 at G-1, with distance from G 1 to 2 in Fig. 4 and G 1 on pattern as a centre strike an arc cutting one struck from C 1. A dotted line should be drawn from the point obtained to C 1 to keep tab on the work as it proceeds.

With 2-2 in Fig. 2 and with point 2 just obtained as a centre, strike an arc near C 1; with C 1-2 in Fig. 4 and C 1 of pattern as a centre strike an arc cutting one just made; with 2-3 in Fig. 4 as a radius and point 2 just obtained as a

centre, strike an arc near point 2 on upper part; with 2-3 on small profile as a radius and point 2, small end, as a centre, strike an arc cutting one just made. Where these meet is point 3 of small end. With this point as a centre and 3-3 of Fig. 2 as radius, strike an arc near 2 of large end; with 2 of large end as a centre and 2-3 of large profile in Fig. 4 as a radius strike an arc cutting one just made. Where these arcs meet is point 3 of large end. With this point as a centre and 3 to 4 on Fig. 3 as a radius, strike an arc near 3 of small end; with 3 of small end as a centre and 3 to 4 of small profile as a radius strike an arc cutting one just made. Where these arcs meet is point 4 of small end. With point 4 just obtained as a centre and 4-4 of Fig. 2 as a radius, strike an arc near point 3 on large end; with point 3 on large end as a centre and 3 to 4 of large profile as a radius, strike an arc cutting one just made. The points where arcs meet is point 4 of large end. With point 4 just obtained and 4-5 on Fig. 3 as a radius, strike an arc near 4 on small end; with 4 on small end as a centre and 4 to 5 on small profile as a radius, strike an arc cutting one just made. Where arcs meet is point 5 on small end. With point 5 as a centre and 5 to 5, Fig. 2, as a radius, strike an arc near point 4 on large end; with point 4 on large end as a centre and 4 to 5 of large profile as a radius, strike an arc cutting one just

(Continued in next issue.)



Vital Statistics in the Public Health Services

Showing How Misleading the Records on Vital Statistics May be if Not Thoroughly and Practically Compiled, and Should Not be Mere Figures.

By George C. Whipple, Consulting Engineer, New York City, Professor of Sanitary Engineering, Harvard University.

It is easy to make a fallacious use of averages and ratios. Fictitious accuracy should be avoided. If 35 out of 75 balls were white the percentage of white balls would be 61.404. The smallest possible error, that is one ball, would change the percentage to 59.65, or to 63.16. Clearly, in such a case it is illogical to compute the percentages in fractions. Whenever percentages or death-rates are being compared, and found to differ by small amounts, the data should be scrutinized to determine whether or not the figures used have a real or a fictitious value. For example, the death-rates for populations of less than 1,000 are almost useless beyond the second significant figure.

Another danger is that common to all forms of reasoning, namely—that of using post hoc for propter hoc. This and other fallacies are very likely to creep in unawares in statistical work under cover of apparent accuracy and thoroughness of investigation implied by the use of columns of figures. Bailey has well said that the phrase "Other things being equal" has covered up a multitude of sins. As a rule, the other things are not equal. He also warns against the hidden errors that may lie in the use of the terms "It is undoubtedly true that" and "It is probable in this case" Of great importance is it, therefore, to make sure that the data collected are sufficient in kind and number for the purpose for which the statistics are intended. No better preparation for the work of the statistician can be had than that given in a course of study in formal logic.

To sum up in a word, we may say that first of all vital statistics must be used with truth.

Vital Statistics Not Mere Figures.

But statistics are not figures; they are numerical statements of facts. Unless this is realized, vital statistics will be used to little advantage. Unless the facts behind the figures can be visualized, they will mean but little to the sanitarian and to the public. Hence imagination is the second element to be considered.

When the Titanic sank with its hundreds of lives public imagination went aflame. The vital statistics of that disaster were studied from one end of the land to the other. Imagination pictured the tragic deaths of the lost and the

mental sufferings of the saved. The recent floods in the Ohio valley likewise aroused the nation. The horrors of those terrible days were past description. No need for imagination to be spurred at such a calamity, yet the deaths due to these floods increased the annual death rate of Ohio by less than one-tenth of one unit per thousand. Yet when the death-rate for a state rises or falls by one or even by two or three units per thousand from scattered causes, we comment coldly on the fact, and vital statistics are then only figures—something to tabulate and put in reports to be put away on dusty shelves.

100 Deaths an Insignificant Matter.

Somebody was looking over some recent figures for the typhoid fever death-rate in one of the boroughs of New York City and found it had fallen to less than ten per one hundred thousand, and remarked that "now this disease has become insignificant." Yet in that district of a million people the rate of ten per one hundred thousand meant that a hundred people died within the year of this preventable disease, and that a thousand others, perhaps two thousand, lingered through long weeks of sickness; it meant that other thousands gave their time as nurses and waited with anxiety through long weeks; it meant loss of income to many and financial shipwreck to some. When viewed in this light, vital statistics have a meaning far beyond the conception of the mathematician, or the vagaries of the laws of probability. The statistician must feel that he is dealing not with figures, but with the facts of life and death. Seriously must he regard his work. With this conception he will be spurred to greater accuracy and be more careful in drawing his conclusions.

We hear a good deal said about the scientific use of the imagination, yet we fail to apply it to this branch of science.

Sanitation Reduced Death-rate.

Not because of its importance, but merely by way of illustration, I would like to call attention to one of the causes of our decreasing death-rate, for it is a fact that the general death-rates are decreasing in nearly all parts of the civilized world. To what is this decrease to be attributed? To many causes. To improvements in the art of healing, to improvements in surgery, to advances in

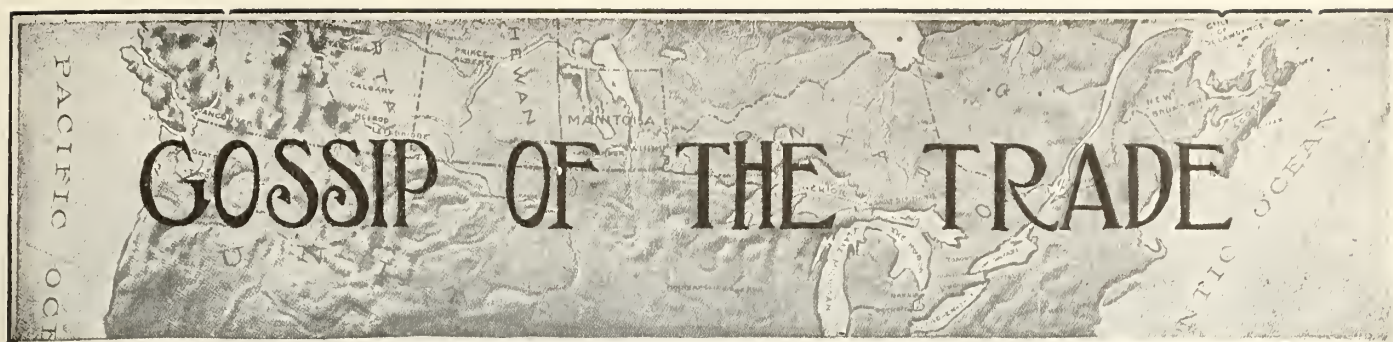
the sanitary arts, and to preventative medicine and to other causes. But there is one fact often lost sight of, namely—that the birth-rate is decreasing, and this tends to make the death-rates lower. This decrease of the birth-rate is a common phenomenon in most of our civilized communities. In order to understand how the birth-rate influences the death-rate, it is necessary to consider the specific death-rates at different ages. The specific death-rate is high for children less than one year of age. The rate falls rapidly during the second and third years, and reaches a minimum at an age of between twelve and fifteen years. From that time on it rises slowly until the age of sixty or more, and then rises rapidly to old age. Hence it follows logically that when fewer children are born there are fewer children to die, and in consequence the general crude death-rate of the community is lower when fewer children are born.

Sanitarians Not to Claim Too Much.

We might even go farther in our scientific use of the imagination and correlate the decreased death rate with the increased age at which persons marry today as compared with a generation or two ago. For it can be readily shown that postponed marriage tends to a reduction in the number of children born. We should be careful, then, not to take too much credit to ourselves as sanitarians for the decrease in the death-rate. Social conditions of many kinds need to be reckoned with.

We should also use care in comparing the death-rate of one city with that of another. We must realize that cities are great aggregates of individuals who differ not only in age, but also in sex, in nationality, in social condition, and in many other ways, and that all of these facts have a bearing upon the healthfulness and the expectation of life of the individuals. The death-rates for two cities, therefore, cannot be fairly compared where there are great differences in the constituent individuals. In a recently settled community there may be fewer children and fewer old people than in a community of longer standing. Hence, the death-rate in the newer city may be low, not because of better sanitary conditions, but merely because of the absence of persons at those ages for which the specific death-rates are high.

(Continued in next issue.)



AN AMUSING INCIDENT.

It's not often things get so rushed in the sanitary and heating business as has been the case with some of the boys in and around Toronto. Jack McMichael, who hangs out at the James Robertson Co., on Spadina Avenue, has had to call into commission his friend Dick Crashley, with his car, so as to be on time before his desk got too overloaded with orders that he could not get out the goods, and Dick Crashley, otherwise known as the millionaire kid, because of the fact of him being overweighted with Mazuuma, kindly agreed to see that Jack be on time at his desk henceforth and for evermore.

Frank Webb, of Militia fame, kindly agreed to officer the bargain, and was therefore on hand to see that the initial

NEW BUSINESS.

Chatham, Ont.—Messrs. Back & Boa have opened a plumbing and heating shop at 48 Fifth Street.

* * *

OBITUARY.

Kingston, Ont.—The death occurred recently of Wm. Hamilton, of Hamilton Bros., tinsmiths and plumbers.

* * *

CAPITALIZATION.

Ideal Plumbing and Heating Co., capitalized at \$10,000; head office, Sault Ste. Marie, Ont.

* * *

MONTREAL CRAFTSMAN DEAD.

David Glen, a well-known Montreal citizen, died recently at his residence 255 University street.

Raid he was a volunteer and received a medal for his services. He was also a life-member of the M. A. A. A. and belonged to the St. Lawrence Lodge of Masons.

Mr. Glen is survived by his wife, four sons, George, Charles, William and Bruce, and four daughters, Mrs. C. D. Turner, Mrs. C. J. Marshall, Mrs. George Boon and Miss Alice Glen.

* * *

RETURNED FROM EASTERN TRIP.

L. White, Winnipeg manager of the James Robertson Co., has been East on a business trip.

* * *

A CREDITABLE MOVE.

The St. Jean Baptiste Society has decided to ask the city to guarantee its bonds, as is authorized by the law adopted by the Legislature last winter, for the purpose of erecting sanitary dwellings in Montreal. At the meeting of the Board of Control yesterday, Mr. Olivier Asselin, president of the society, outlined the proposal. In substance, what was suggested was that the St. Jean Baptiste Society would agree to invest \$150,000 in the affair providing the city would guarantee its bonds for the amount of \$850,000. The management of the enterprise would be confided to a subsidiary company affiliated with the St. Jean Baptiste Society, the City of Montreal being represented on the board of directors.

While casually remarking that model homes for workmen would be the best way to fight the high infantile mortality, Mayor Martin said that the corsets as worn by many women was responsible for many things unfavorable to the rearing of children.

On the motion of Controller Cote, it was resolved that the question of sanitary dwellings be submitted to Controllers Herbert and Ainey for study and report.

* * *

PUBLIC HEALTH FIRST.

For the protection of public health, two ordinances that have hitherto been honored as much in the breach as in the



Left to right: Jack McMichael, Dick Crashley, Frank Webb, W. J. Dunlop.

trip was carried off in good style and to time; and Dunlop felt that on account of the great benefit which the trade would derive by speedier delivery of supplies, he would be allowed to overlook the proceedings. Incidentally we heard that Mr. Dunlop has changed his place of business from McCaul Street to Spadina, that his new premises are much more convenient because of the close proximity of the bank.

He was born in Montreal in 1839 of Scotch parents in a house on St. Antoine square. He lived for about seventy years in his late residence at 255 University, and when it was built the district was a field. It was he who planted the trees which are now to be seen in the district.

Mr. Glen was a well-known master plumber, being one of the pioneers of the trade in the city. During the Fenian

observance are being enforced in Fort William this year. These are the installation of sanitary conveniences by owners of houses on streets where sewers are laid; and the enforcement of regulations governing the sale of milk and a better inspection of that food.

The placing of the health department on a good basis this spring enables it to functionate properly. The addition of a permanent medical health officer and an assistant sanitary inspector put the health department on a working basis. The inspection of dairies located in the city has been a blessing, and this, followed up this year by inspection of milk coming into the city from outside, insures for the citizens a better milk supply than has been possible in the past.

Possibly, the installation of sanitary conveniences by the city ordering the connection and letting the contract for the same, to be repaid in five years by the owner, is an expensive method. The installation plan is always an expensive one, but it is more than justified on the basis of public health, and very good reasons should be advanced before any owner is allowed to evade the order. The enforcement of this ordinance begins with the owners of the larger houses, and grades down according to the size of the buildings.

* * *

BROTHER PETER CAMPBELL HONORED.

One of the best known members of the sanitary and heating profession in St.



John, Mr. Peter Campbell, of Prince William Street, where he has conducted a business for many years, was honored this week by fellow members of the

EXTRACT FROM SASKATCHEWAN PUBLIC HEALTH ACT.

53a. In this section and the four following sections, unless the context otherwise requires, the expression:

Public Place.

1. "Public place" means railway, railway station, railway car, school, municipal building, hotel, restaurant, club, theatre, opera house, public hall, amusement ground, resort, factory, office, store, lodging house, boarding house, or any tent, building or structure of any kind to which the public have access;

"Common Use."

2. "Common use" means use by more than one person.

Common Drinking Cups Prohibited.

53b. No person owning or controlling a public place shall provide drinking cups for common use or allow drinking cups for common use to be in or upon the premises.

Railway Companies.

53c. Railway companies shall supply paper drinking cups to passengers on request or shall keep them for sale on their passenger trains at a rate not exceeding one cent for each cup.

Towels for Common Use Prohibited.

53d. No person owning or controlling a public place shall furnish towels for common use or permit towels intended for common use to be upon the premises; but where towels are furnished for the public or for guests, patrons, visitors or employees, the proprietor, manager or person in charge shall provide individual towels for each person.

Sanitary drinking fountains.

53e. Persons owning or controlling a public place where drinking water is supplied for the public resorting thereto shall furnish for their use sanitary drinking fountains, or individual drinking cups:

Provided that no water for drinking purposes shall be kept in open vessels at any time.

(2) The provisions of this section shall come into force on the first day of June, 1914. 1913, c. 7, s. 10.

Please bring the above legislation to the notice of your Board.

Commissioner of Public Health.

Masonic Order in honor of his fifteenth anniversary as treasurer of the Masonic Hall Co. The shareholders and directors at a largely attended meeting presented to Mr. Campbell a valuable three-piece tea set of sterling silver. The inscription on the remembrance was "Presented by the New Brunswick Masonic Hall Co. to Brother Peter Campbell in recognition of fifteen years' efficient services as treasurer."

The presentation was made by Dr. Walker, and Mr. Campbell made an appropriate reply, thanking the members for their kindness and thoughtfulness, and recalling his fifteen years' activity with considerable pleasure.

* * *

EXTENSIVE ADDITIONS.

The alterations being made to the offices and warehouses of the Plumbing and Engineering Supply Co., Simpson Street, Fort William, will probably be finished by the first of July. The old building has been moved to the rear of the lot and a new building will be constructed, at the front of which will be

one storey in height and will contain five stores. At the extreme rear end of the lot a receiving warehouse has been constructed which is supplied by a spur track from the C.P.R. The renovations and new buildings, when completed, will cost in the neighborhood of \$15,000.

* * *

A FEW HANDY SHOP KINKS.

Editor Sanitary Engineer:—I am here enclosing a few kinks which may be new to some of your readers.

R. F. H., Sask.

Some time ago I was completing a job out in the country and required a 1¼-in. x 1-in. bushing. I simply took a 1-inch coupling and opened up the dies to 1¼,

An Old One, But Good.

No doubt the above is a good kink, which has been worked scores of times, but is none the less worthy of credit, and particularly when a fellow is really up against it, and has never heard of the kink before.—Editor.

A Splendid and Practical Piece of Lead Work

Showing How the Work Was Accomplished, the Necessity for More Study of Lead Working so as to Know What Various Forms Lead May be Worked Into.

IT is not often we are so fortunate these days as to meet with an actual lead worker, who keeps up his practice because of the benefits he finds from such practice by being able to apply it to his every-day occupation.

In speaking of lead-working a few days ago with Mr. Le Breton, we found that such was the case in his experience. For instance, when it is necessary to make a graceful looking offset on a 4-inch lead bend which cannot be gotten except by wiping it on crooked to the ferrule, in such a case it is far more workmanship-

trade in the Old Country and has had a varied experience in several countries. He is at present in the employment of George W. Richardson, sanitary and heating engineer, 195 Adelaide Street, Toronto, who makes a specialty of repair work and reconstruction work only, and both these gentlemen agreed with Sanitary Engineer that a thorough knowledge of lead work is as essential to every journeyman as any other line.

Practice in lead work of such a nature as we here reproduce is the most beneficial that can be had for various reasons. First procure a piece of sheet lead, 5 lbs. per square foot, 21 inches square. Now let us take up the several operations required to make a 6-branch piece such as is shown both in photographs and drawings. Fig. 1 shows the first shape which is to be made, and in working up this piece care should be taken not to stretch any portion so as to make the material uneven in thickness; in fact, throughout the whole of the operations this should be kept in mind, because wherever the lead is drawn out too thin it will make it more difficult to boss it up again. Fig. 2 is the next form to make, and should be formed up as even as possible and well balanced, for the simple reason that if it is not true greater trouble will be experienced when forming up Fig. 3. There should always be a common center established and kept; for instance, if Fig. 2 is a little out of shape and not even on center, the arms which are necessary for the branches will not be in center with the vertical pipe. Fig. 3 is worked up by bossing back the lead from the outside as well as bossing out from the inside to some extent. These three figures are almost sufficient to the ordinary plumber to know what course to take. Fig. 4 is a perspective view of the finished model. We would be very much interested to know of any of our readers taking up the task of making such a

branch model. Mr. Le Breton also showed Sanitary Engineer another very fine piece of lead work, which is shown in the two photos reproduced, that of a lead box which was also worked up from a piece of 5 lb. sheet lead. The most interesting part of this box is that the walls, corners, and bottom are all an even thickness, which is $\frac{1}{4}$ of an inch. No seams or joints of any kind the size of the lead box is 6 inches square and 7 inches deep. Referring to the six-branch piece, we may say each branch is 4 inches long and 2 inches in diameter,



W. M. Le Breton and Two Samples of His Lead Work.

like to work the bend to the desired angle than wipe is crooked.

Mr. Le Breton served his time at the



A Six-Branch Piece of Lead Work Without Joints or Seams of Any Kind.

with the exception of the lower branch, which is a little longer and worked out so as to form a base to stand upon.



FIG 1.



FIG 2.

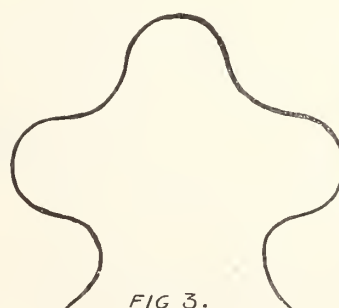


FIG 3.

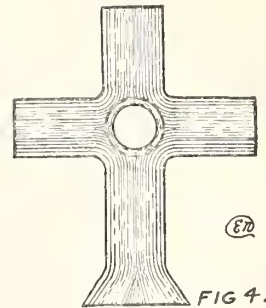


FIG 4.

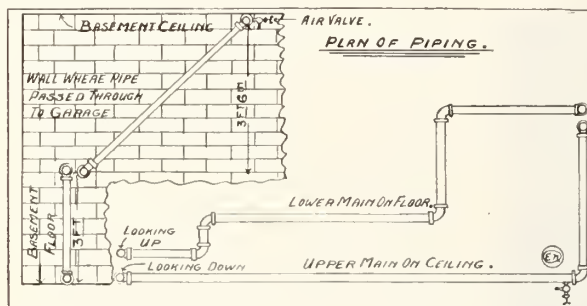


Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

CAN AN AUTO GARAGE BE HEATED BY A COIL IN THE FURNACE?

Editor, Sanitary Engineer.—“Can an auto garage be heated properly by using a coil in a hot water furnace?” Such was the question which was asked last fall, and as the garage happened to be a short ride from the office of Sanitary Engineer, we made some investigations and went into the matter. After having decided that it could be done, we showed how, under the circumstances, such an installation should be piped, several members of the craft had their doubts about it, but finally it was installed as shown in Figs. 1 and 2, and after having been tried out this last winter, the owner is perfectly satisfied that he has got a splendid job, and one which did not cost a very big sum either.

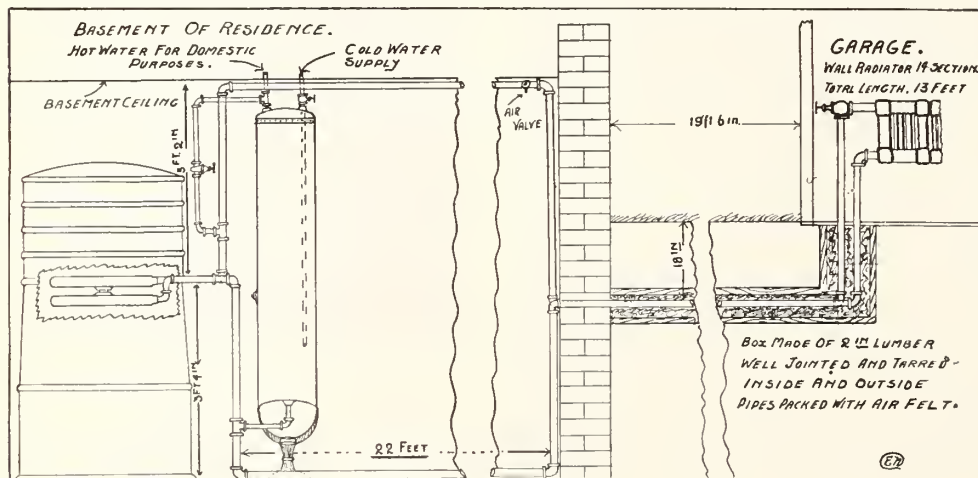
The installation consisted of two 12-in. cast-iron heaters, such as are used for heating water for domestic purposes, and were coupled together with a 1-in. close nipple, then two 1-in. male and female malleable elbows were used to bring the two outlets on the heater parallel with each other so as to project through the holes in the side of the furnace fire pot;



Showing position of piping and fittings used and the wall plan of piping where it ran through wall underground to garage.

then the pipe from the bottom heater was run to the floor as shown and the other pipe upwards to the basement ceiling: a 1-in. x $\frac{3}{4}$ -in. tee was placed on the upper pipe, and connections made to the range boiler. It may be stated that in this case the owner had already installed the range boiler in position shown and did not wish to have it changed. On the lower pipe another 1-in. x $\frac{3}{4}$ -in. tee was placed, just low enough to clear the bottom of the range boiler, and $\frac{3}{4}$ gate valve was also inserted on the upper pipe so as to regulate the flow to the range boiler. This valve served to check the heat from robbing the radiator when water was drawn from the range boiler.

Of course, there was a slight variation of heat when cold water was run into the boiler, but with the large heating surface and the valve being regulated, the heat could not circulate to the boiler and rob the radiator, as would have been the case had the valve not been there. After the connections had been taken off, the flow and return were run perfectly level until they reached the wall, where they were carried through, so as to be at a point about 18 inches under the ground. They were placed in a long wooden box made of two-inch lumber and barred inside and out. The pipes were well packed in air felt and covered with a lid of the same-sized lumber and barred



Showing how hot water heating system was installed in a residence to heat a garage; two 12-in. Bigley heaters were connected together by a one-inch nipple and piping connected to range boiler as shown. This system gave splendid satisfaction last winter.

also. A long wall radiator of 14 sections was used and given a gradual slope upward from the feed and return. The piping was all of one-inch size and was all reamed. By looking at the plan of piping it will be seen that no less than six elbows were used; these were necessary so as not to have pipes running across the floor. It would not be advisable to use so many elbows if they could be dispensed with, and no doubt if fewer elbows had been necessary, the installation would have even worked better. It must be stated that this was connected to the city pressure because of the fact that the range boiler was first connected in this way.

REASON WHY SEWAGE WILL NOT FREEZE.

Editor, The Sanitary Engineer,
Toronto, Ont.

Apparently the question concerning the sanitary disposal of sewage is at last beginning to receive a little of the consideration to which its immense importance entitles it.

Sanitary engineers all over the country are taking pains to obtain accurate information and to qualify themselves to deal intelligently with it as it arises from time to time under varying conditions.

Having had an experience covering over 25,000 installations, I may be pardoned for dropping a few hints concerning the fundamental conditions governing a successful installation.

First and foremost, the installation of a successful septic tank system depends upon the utilization of the forces provided by nature. These in this case consist of the countless millions of bacteria found close to the surface of the ground.

I have been asked hundreds of times why the distributing systems cannot be placed below the frost line, and also why, when placed so close to the surface, they will not freeze in winter time. The answer to the first question is: that the micro-organisms, so essential to the destruction of waste matter and its conversion into nitrates and other useful chemical properties, are not found below the point at which free oxygen can be obtained. It is a well-known fact, of course, that the top soil is rich soil, and deep soil is absolutely non-productive. The difference between the two is produced by the presence of bacteria in one and its absence in the other, and if waste matter is buried below and beyond the bacterial action, surface water finding its way gradually downward to the rock strata, carrying with it crude sewage, which will pollute sources of water supplies sometimes miles distant.

The answer to the second question is: that the heat generated by decaying waste matter has always proven to be

sufficient to prevent frost interfering with the operation of the system when installed in accordance with the instructions given from time to time in your paper. This condition is indicated, for example, by the piles of ordinary stable manure in any farm yard in the country. On the coldest days in winter these piles steadily generate heat, due to no other cause than the breaking down of the cells by the contained bacteria.

A complete understanding of these two points leads us directly to another—namely, that bacteria, while extremely efficient, are limited in their power, and that if given too much work to do will die off; and such a condition would be very soon created by a construction such as is shown in the sketch made by C. F. G. in your current issue.

The successful operation of a plant depends upon an automatic mechanism that will permit the storing of a considerable quantity of liquid sewage in

and a positive operating automatic device, such as was shown in the article by the writer which recently appeared in your columns, a septic tank system should operate year after year with absolutely no attention.

M. J. QUINN.

WHAT WILL PREVENT RUNNING ROPE FROM STICKING?

Editor, Sanitary Engineer.—Kindly furnish me with information in your next issue of Sanitary Engineer as to what I should apply to an asbestos running rope so as to prevent the lead from sticking to it. A reply in your next issue will greatly oblige.

A Constant Reader.

There may be many things used, and often the manufacturers of these running ropes have a special compound. However, the writer has used a running rope for years and simply used a little pure

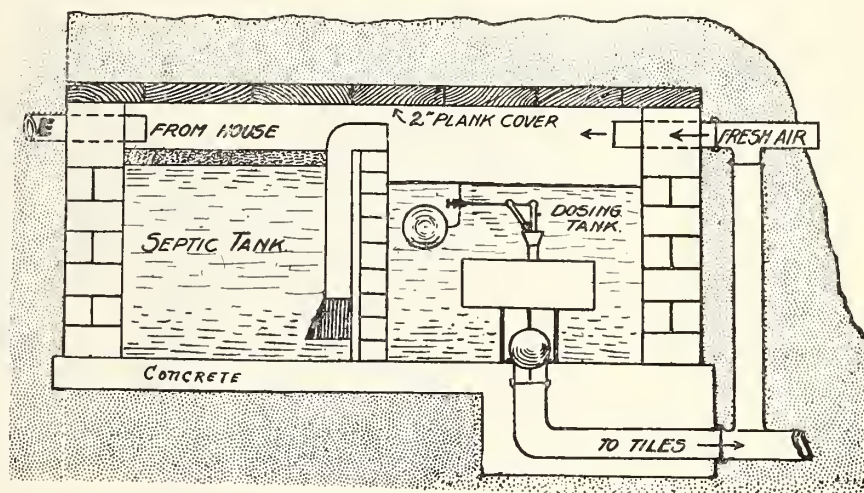


Fig. 1.

one of the chambers of the tank and a sudden discharge of the whole amount so stored into a tile system that will distribute it over an area sufficient to make the amount of work done by the bacteria in any part of the area comparatively small.

Referring to the sketch in question, it will be evident to any person that this tank will never empty. The sewage will not rise as high as the dotted line, but will dribble continuously over the return bend, and will soak away into the soil at the first opportunity. This means that all of the sewage will be discharged into such a small quantity of soil that the latter will "sour" very quickly. The tile pipe and tank will fill up and the whole system will have to be taken apart.

Incidentally, the overflow from compartment No. 1 to No. 2 should be at least 4 inches below the inlet, and the air inlet to No. 2 should be slightly lower still. With such a construction

lard free from salt. If there is the smallest amount of salt in the lard the lead will stick.—Editor.

REPLY TO T.A.C. RE SEPTIC TANK.

Editor, Sanitary Engineer.—I missed April 15 issue of Sanitary Engineer, being away from home, and I see you have septic tank sketch of which I sent you, in June 1st issue, with remarks by T.A.C.

Now, there are three changes to be made in that figure.

First, overflow to second tank is at least $2\frac{1}{2}$ to 4 inches below inlet to insure inlet being always open.

Second, middle wall goes to top of tank to support cover, and I saw four field tile, 4 in. diameter, and place in wall to allow air to pass through.

Third, I use on end of long bend an ordinary tile trap.

Formerly I used to use a P trip under second, chamber 4 in. C.I. type, but I

had trouble as follows:—Chamber overflowed, and upon being examined we found it to be filled in C.I. trap with a thick brown jelly substance, and I have never been able to find cause, but I put a long bend in and tile trap with vent, and although it has never clogged, my idea was it was easier to dig up and get at than to melt out the cast-iron trap in second chamber. C. F. G.

The alterations may be seen by the dotted lines of tile trap. The septic tank is the same, with that exception. We, however, believe that all syphons should have an air vent pipe leading through the return bend down to the bottom, so as to break the syphonic action. Such a pipe is supplied with the drawing of septic tank by "Mearns," which we herewith reproduce.



INTERESTING YET SIMPLE QUESTION.

Editor Sanitary Engineer:—When figuring up the quantity of heating surface required in a building, either steam or hot water, it is usual to allow so much per cent. of one-inch pipe according to the climate and build of the house. Then, having determined how much 1-inch pipe

For instance, take one foot of one-inch pipe and rip it down at the lap, which will, when flattened out, be a shade over four inches in width, which would be, of course, one-third of a foot of sheet iron. By placing three pieces the same size side by side we would have a square foot. Then if heat was applied we would have one square foot of heating surface. Thus it is plainly seen why the one-inch pipe is divided by three to arrive at radiation.—Editor.



HOW CAN VILLAGES ENJOY CITY PRIVILEGES?

Editor Sanitary Engineer:—In your last issue you published an article which stated that country towns and villages could be made as sanitary and even more so than large cities. Such a statement seems to me to be considerably wide of the mark, if you will pardon the remark; but at the same time could you give me some information showing how such privileges can be enjoyed? Interested.

Replying to "Interested," we believe he refers to the article speaking of the Panama project, and also the problem of military camp sanitation. Now, first

septic tank and irrigation tiles about a foot under ground, which ground, as we stated before, is almost always available, the residence has its own sewage disposal plant, and there you are. As far as lighting, this, too, can be had in the shape of either small acetylene plant or gasoline, or even a small electric unit can be installed very economically. All of the latter equipments can be had to suit almost any sized residence. "Interested" may say, "Oh, yes; but as the village grows, ground will become more costly, etc." We may state that is a matter which is in the hands of the municipalities. If to prevent overcrowding a municipality passes a by-law requiring certain-sized houses, which may be built to accommodate, say, six persons, to have so much vacant ground for the purpose of sewage disposal, they would eliminate overcrowding, pollution of streams, necessity of large sewage disposal plants, which up to the present are only in an experimental stage, and which are far more costly to the public which use them than a separate small sewage system, spoken of before. Another thing let us here state: Too many large cities are going to be a menace to Canada. What is required most are big villages where the worker can, as it were, live in the country. The United Kingdom is proving this statement, and are building big villages. The system of town planning, which is receiving more attention to-day, is going to solve problems on sanitation better than any other scheme ever tried before.



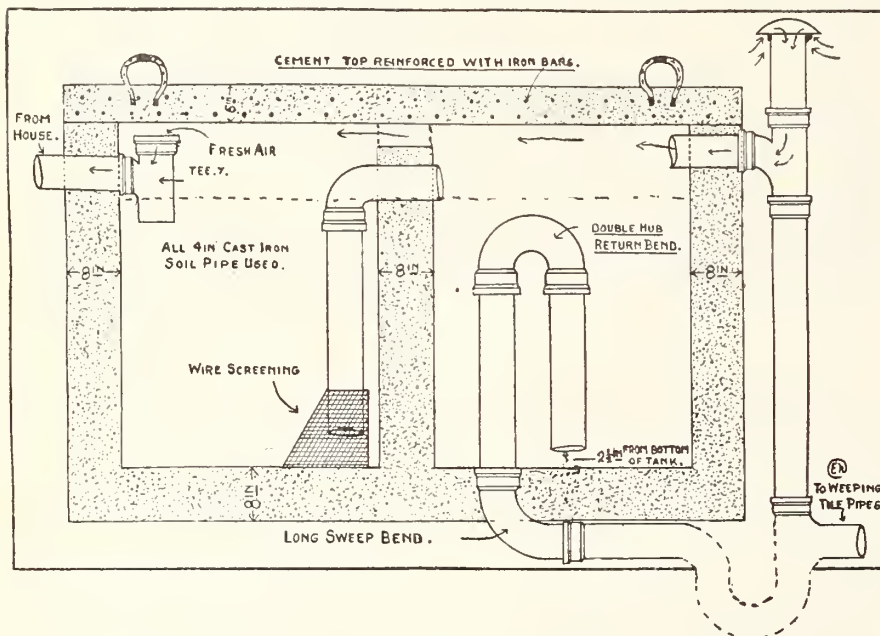
STOPPING THE WATER WASTE.

"It is astonishing," said an engineer who had been investigating water consumption statistics, "that there is such a remarkable difference between the gallons per capita used in various cities. What do you think the maximum and minimum gallons per head per day are?"

The man questioned admitted that his ideas were rather vague.

"The maximum," continued the engineer, "is 398 gallons, the average 121, the minimum 26. This illustrates the tremendous wastage, especially in locations where meters are not used. It has been found that by far the greatest percent. of loss is due to leaky faucets."

In this connection it is interesting to note the appearance on the market of a new washerless faucet which puts an end to leakage. This device is fitted with a conical valve bearing which puts an end to leakage. This device is fitted with a conical valve bearing directly on a spherical seat. This gives a line contact which makes a tight joint, so it is not necessary to jam the handle in an endeavor to stop leakage.



C. F. G. Septic Tank With Additions as Stated in His Reply to T. A. C.

and, say, the number of feet is 1,800 feet, the custom is to divide these figures by 3 and calling the results square feet or radiation. Now, what I wish to know is, why do we divide by 3, and what is it we are really dividing?

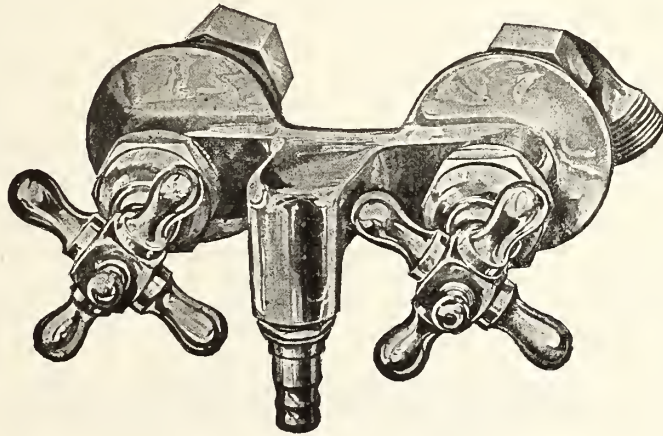
Apprentice.

Replying to "Apprentice," we may state, though his question is very simple, yet very few apprentices get a look in on this very thing. Now without going too deeply into this, we will explain in a simple manner.

of all, the residences in our country towns and villages as a rule have a good-sized garden, or in many cases have splendid lawns, both at the rear, sides and front. These homes are not crowded close to each other, because of the fact that land is not so valuable, or, rather, let us state costly. Now, by having a good well, either dug or drilled for water; then by installing a pneumatic water supply system, which will also act as a fire apparatus, it, of course, working under pressure; then by installing a



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Landing Profitable Business for the Tinshop

Best Work Can Be Accomplished During Dull Season—The Dull Season is the Time to go After the Best Business—Keeping the Shop Busy.

WE hear a great deal these days about the tinshop being a poor paying proposition. Every once in a while a merchant decides to sell out or dispose of his tinshop on account, he says, of it being unprofitable. At hardware conventions the subject is often taken up and men owning tinshops tell their experiences, showing how many customers look at price rather than quality, with the result that many cheap jobs are done at a sacrifice, instead of good work at a fair profit.

We also find merchants who conduct highly-profitable tinshops; in fact, the tinshop is the large end of the business with some concerns.

One merchant who conducts a large tinshop was recently interviewed by a representative of Sanitary Engineer. In his store he sells stoves, enamelware and household goods, cutlery, etc. He does a nice trade in the store, which is a large one, but he stated that the tinshop was the big and profitable end of his business.

When asked how he accounted for this when others complained about the tinshop being a burden, he said: "I have at the present time, which is considered a dull period, fourteen men in my tinshop. Every man is busy. I am always on the look-out for new business. I do not look for cut-price jobs. I think that there is probably more room for 'salesmanship' in connection with the tinshop than in any other department of my business. When I quote a price on a job, I tell the customer exactly what he is going to get. I do not use 30-gauge iron where 26-gauge is needed. Very often I could undertake jobs at lower quotations than the ones I give, providing I used cheap material and lighter gauge metals, but this is against my policy. I use 'salesmanship' in my tinshop the same as in any other department of my business.

"Another feature which I watch closely is 'overhead costs.' I noticed a good illustrated article on this phase of the business in a recent issue of Sanitary Engineer. Every man in the trade should read it.

"I watch the buying end of my business and always try to place my orders in the best markets.

"Preventing waste of material is another important point in connection with running a profitable tinshop.

"Without proper supervision and instructions a large amount of material can be allowed to go to waste, and this means a serious drain on the profits.

"Waste of men's time is also a serious leak if allowed. I always try to have work ahead—that is, I endeavor to get customers to place orders and contracts well in advance in order to always have plenty of work on hand for my men. I have an arrangement with a local factory whereby I supply them with a number of articles that they use in connection with a certain line of goods they make. In spare time the men make up these special lines, and no time is lost.

"I have always made it a point to go

NOTICE TO READERS.

We have quite a number of readers who send in questions to be answered but fail to give us their address. We would like to receive addresses as a guarantee of good faith, also to enable us to answer their question privately. For instance, we had several questions which showed the answer was urgent, because of its very nature, and in such a case the questioner has had to wait in many cases over two weeks and more, and often a question is such that it requires more particulars. Therefore we respectfully ask our readers to give us their full address, which is not necessarily for publication.—Editor.

after quality business. I charge a fair price and add a legitimate profit, and I have been fortunate enough during the past few years to always have plenty of work on hand."

This merchant has made a success of his tinshop. He has made a practice of landing profitable business for this department of his store.

A writer in an American contemporary, referring to the landing of profitable business, says:

"The dull season is the time to go after the best business. The best business is that which involves the largest contract from the man with the best credit rating. This man is always the one who is willing to

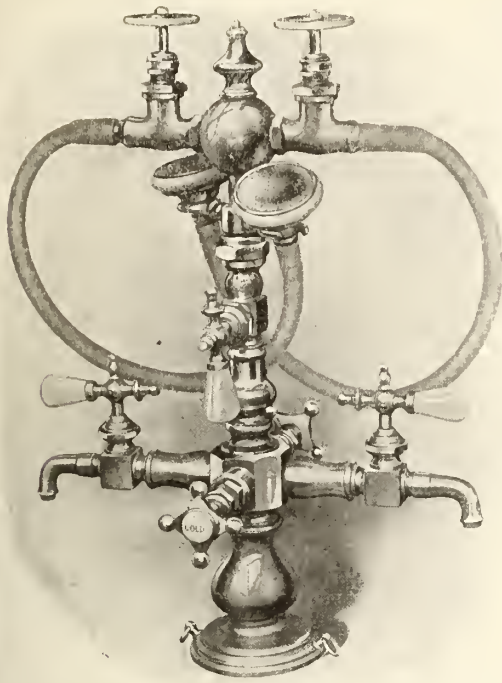
save money and who is in a position to follow his inclinations. Therefore, if he can be shown that he can save money by permitting his work to be done during the dull season, the chances are very good for landing a contract from him.

"Because this man's business is the most desirable, it is necessary that great care shall be used in keeping him as a customer. The best way in which to keep a customer is to do first-class work for him, and the time when the best work is possible is not when work is booming, customers are clamoring for action, and workmen are sent here and there on hurry calls, but in the dull season, when men are not driven and their employers are not nervous.

"The man whose business is worth the most is always the man who is easiest to convince by a good argument and hardest to convince with a poor argument or with a poor proposition. The best way in which to hold a customer is by doing good work, but the only way in which to secure a chance to do good work for a new customer is to make a good impression at the start, and it is, therefore, extremely desirable that the first impression shall be a good one. A little attention to the manner in which a customer is approached, therefore, will frequently result in the securing of contracts over a competitor.

The custom of always giving the contract to the lowest bidder does not prevail with the hard-headed business man whose business is the most desirable. This man knows that the manner in which he is approached will generally indicate the business capacity and responsibility of the man seeking the contract, and he will, therefore, devote special attention to the arguments presented, and will base his selection partly upon the amount of the bid and very largely upon his first impression of the bidder.

The securing of first-class contracts for the dull season should be considered one of the most important portions of the year's work, and the man who keeps after this business intelligently and persistently will frequently find it possible to place himself in such a position that the so-called dull season will have resolved itself into a period which he can reckon as the year's most profitable time."



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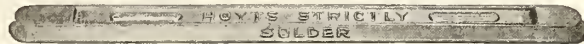


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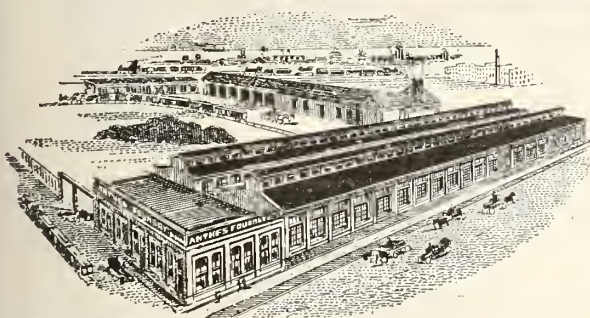
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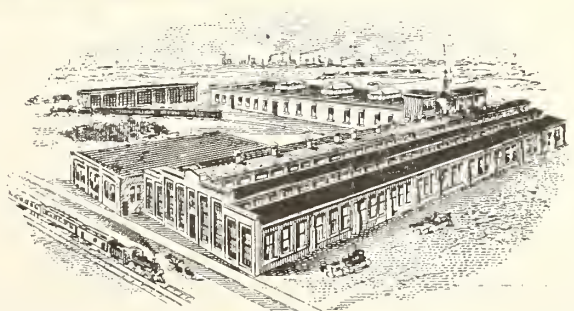
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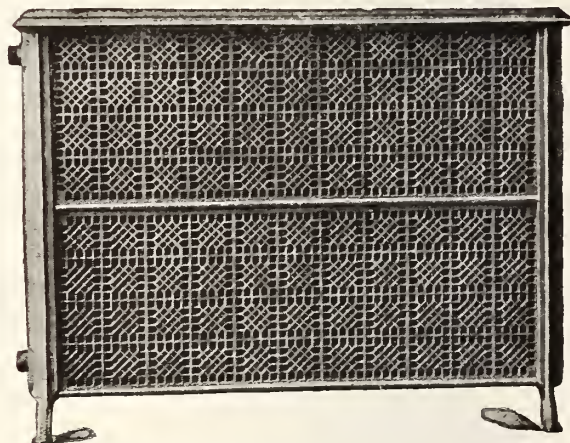
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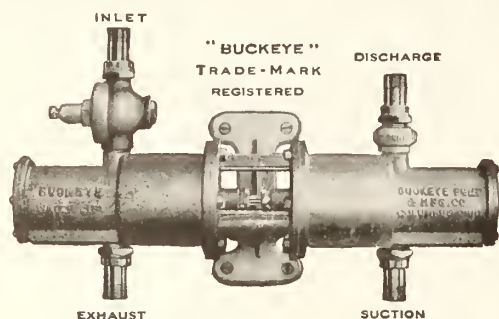
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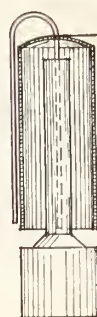
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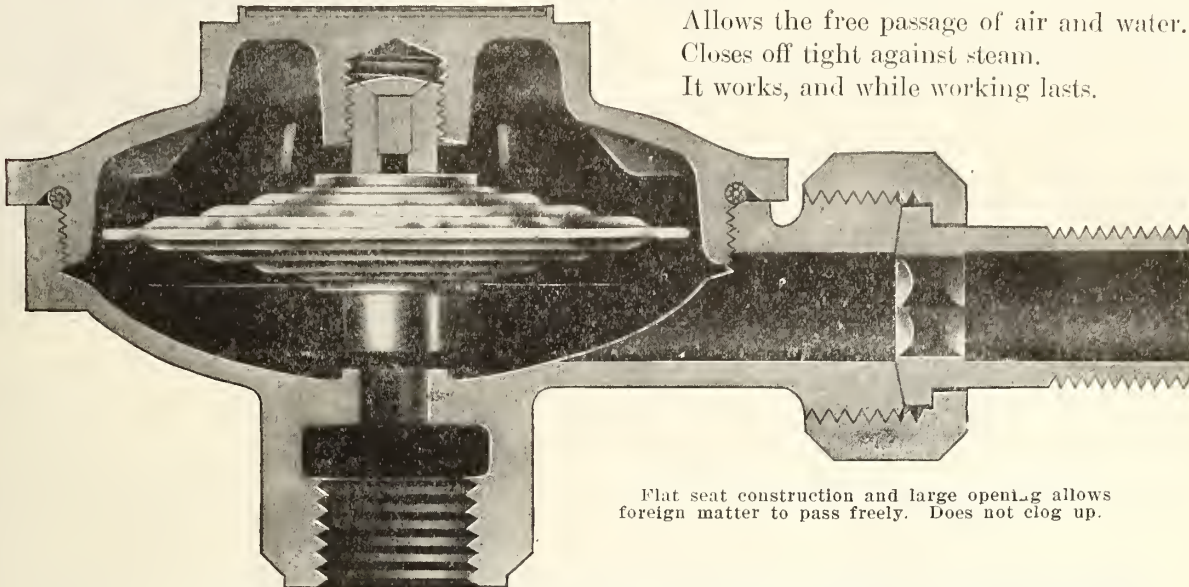
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The index is inserted solely for the convenience of the readers of the paper.

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It works, and while working lasts.

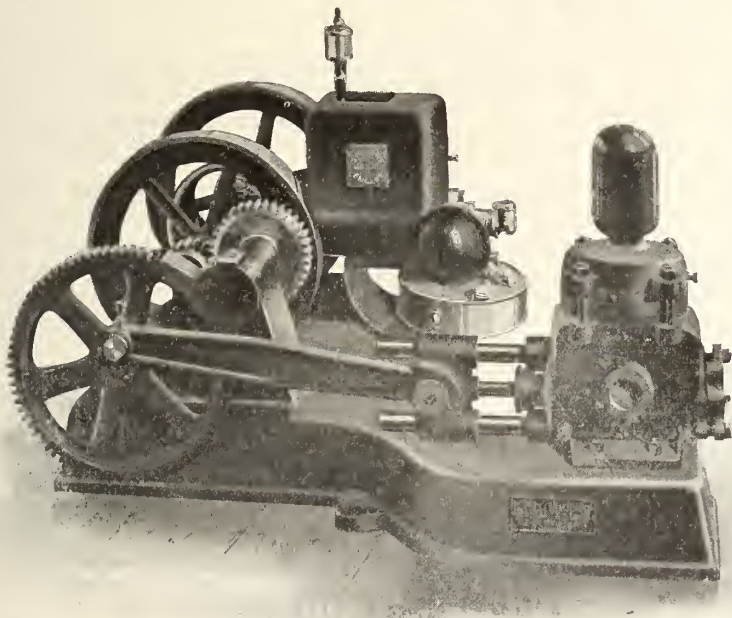
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H. Mueller Mfg. Co., Ltd.
SARNIA, ONTARIO

Makers of High-Grade Plumbing, Water and Gas Brass Goods.



D-9442

H. MUELLER MFG. CO., LTD. S.E.
Sarnia, Ont.

Gentlemen: — Send me Rapidac Hanger catalog and prices on Mueller Rapidac.

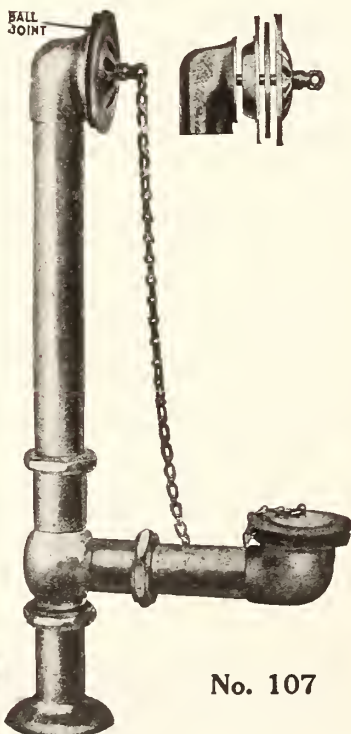
Signed

City Province



The Canadian Lamp & Stamping Company, Limited

FORD, Ont.



No. 107

Automobile Lamps

Plumbing Goods

Brass and Steel Stampings

The Largest Manufacturers of
Waste and Overflows

Basin Traps

Basin Supplies

Bath Supplies

In The Dominion

Ask your Jobber for them



"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."



Occasionally advertisements are inserted in the paper after the index has been printed. The insertion of the Advertiser's name in this index is not part of the advertising order. The index is inserted solely for the convenience of the reader of the paper.

Asbestos Goods.

Can. Johns-Manville Co., Toronto.

Air Line Systems.

C. A. Dunham & Co., Ltd., Toronto.
National Steam Specialty Co., Chicago.

Aluminum Castings.

Tallman Brass & Metal Co., Hamilton.
Canada Metal Co., Toronto.

Brass Castings.

Tallman Brass & Metal Co., Hamilton.
James Morrison Brass Mfg. Co., Toronto.

Brass Goods, Valves, Etc.

James Morrison Brass Mfg. Co., Toronto.
Wallaceburg Brass Mfg. Co., Wallaceburg, Ont.
Empire Brass Mfg. Co., London.
Dunham, C. A., Toronto.

Brass Pipe and Tube.

Empire Brass Mfg. Co., Toronto.
Tallman Brass & Metal Co., Hamilton.
Canada Metal Co., Toronto.

Boilers, Steam or Hot Water.

Warden King Co., Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Pease Foundry Co., Ltd., Toronto.

Burners.

Standard Heating & Radiator Co., Pittsburg, Pa.

Correspondence Schools.

Anglo-American Sanitary School.

Country Residence Equipments.

National Equipment Co., Toronto.
Chicago Pump Co., Chicago.
Leader Iron Works, Chicago.

Closets.

Empire Brass Mfg. Co., London.
James Morrison Brass Mfg. Co., Toronto.
Galt Brass Co., Galt.
Amherst Foundry Co., Amherst, N.S.
Johns-Manville Co., Toronto.

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Fittings, Limited, Oshawa.
Warden King, Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Empire Brass Mfg. Co., Ltd., Loudou.

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Chicago Pump Co., Chicago.
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Fittings, Limited, Oshawa.
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National Steam Specialty Co., Chicago.

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Honeywell Heating Specialty Co., Montreal.
James Morrison Brass Mfg. Co., Toronto.
National Steam Specialty Co., Chicago.

Heaters.

Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.
Standard Heating & Radiator Co., Pittsburg, Pa.
Pease Foundry Co., Ltd., Toronto.

Lead.

Canada Metal Co., Ltd., Toronto.
Tallman Brass Mfg. Co., Hamilton.
Empire Brass Mfg. Co., London.
James Morrison Brass Mfg. Co., Toronto.

Machinery Pipe Threading.

Hall & Sons, Ltd., Brantford.

Nipples.

Canadian Tube & Iron Co., Ltd., Montreal.
Warden King, Ltd., Montreal.

Steel & Radiation, Ltd., Toronto.
Canada Metal Co., Ltd., Toronto.

Galt Brass Co., Galt.

Canadian Brass Co., Galt.

Empire Brass Mfg. Co., Ltd., London.

Wallaceburg Brass Mfg. Co., Wallaceburg.

Canadian Wolverine Co., Ltd., Chatham.

James Morrison Brass Mfg. Co., Toronto.

Packing.

Canadian Johns-Manville Co., Ltd., Toronto.

Pipe, Black and Galvanized.

Canadian Tube & Iron Co., Ltd., Montreal.

Steel & Radiation, Ltd., Toronto.

Warden King, Ltd., Montreal.

Pipe Joint Compounds.

National Steam Specialty Co., Chicago.

Pipe, Soil, and Fittings.

Empire Brass Mfg. Co., London.

Galt Brass Mfg. Co., Galt.

Pumps.

Leader Iron Works, Chicago.

Chicago Pump Co., Chicago.

C. A. Dunham & Co., Ltd., Toronto.

National Equipment Co., Toronto.

Radiator Fittings.

National Steam Specialty Co., Chicago.

Radiators.

Warden King, Ltd., Montreal.

Steel & Radiation, Ltd., Toronto.

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Mouat-Squires Co., Cleveland.
Honeywell Heating Specialty Co., Montreal.

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Borden-Canadian Co., Toronto.

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Standard Sanitary Mfg. Co., Ltd., Toronto.

Amherst Foundry Co., Ltd., Amherst, N.S.

James Robertson Co., Ltd., Toronto.

Mott Company, Ltd., Montreal, Que.

James Morrison Brass Mfg. Co., Ltd., Toronto.

Galt Brass Co., Ltd., Galt.

Cluff Bros., Church St., Toronto.

Porcelain Ware.

Standard Ideal Mfg. Co., Ltd., Port Hope, Ont.

Standard Sanitary Mfg. Co., Ltd., Toronto.

Amherst Foundry Co., Ltd., Amherst, N.S.

Cluff Bros., Church St., Toronto.

Galt Brass Co., Ltd., Galt.

Flushometers.

Canadian Wolverine Co., Ltd., Chatham.

James Morrison Brass Co., Ltd., Toronto.

Mueller Mfg. Co., Ltd., Sarnia, Ont.

Empire Brass Mfg. Co., Ltd., London, Ont.

Galt Brass Co., Ltd., Galt.

Canadian Brass Co., Ltd., Galt.

Septic Tank Valves.

National Equipment Co., Ltd., Wabash Ave., To-

ronto.

Galt Brass Co., Ltd., Galt.

Canadian Brass Co., Ltd., Galt.

Alex. I. Mearns, St. Genevieve St., Montreal.

James Robertson Co., Ltd., Toronto.

Gasoline Engines.

National Equipment Co., Ltd., Wabash Avenue,

Toronto.

Electric Pumping Machinery.

National Equipment Co., Ltd., Wabash Avenue,

Toronto.

General Machinery Co., Ltd., Toronto.

Oil Storage Systems.

National Equipment Co., Ltd., Wabash Avenue,

Toronto.

Water Supply Systems.

National Equipment Co., Ltd., Wabash Avenue,

Toronto.

Pipe and Radiator Hangers.

Beaton & Cadwell Mfg. Co., New Britain, Conn.

Air Valves.

C. A. Dunham Co., Ltd., Toronto.

Gurney Foundry Co., Ltd., Toronto.

Steel & Radiation Co., Ltd., Toronto.

Beaton & Cadwell Mfg. Co., Ltd., New Britain,

Conn., U.S.A.

Radiator Foot Rests.

Beaton & Cadwell Mfg. Co., Ltd., New Britain,

Conn., U.S.A.

Floor and Ceiling Plates.

Beaton & Cadwell Mfg. Co., Ltd., New Britain,

Conn., U.S.A.

Steel & Radiation Co., Ltd., Toronto.

Gurney Foundry Co., Ltd., Toronto.

Warden King, Ltd., Montreal.

Vitro Tanks.

Cluff Manufacturing Co., Ltd., Toronto.

James Robertson Co., Ltd., Toronto.

Cluff Bros., Ltd., Church St., Toronto.

Brass Goods.

H. Mueller Mfg. Co., Sarnia, Ont.

Canadian Johns-Manville Co., Ltd., Toronto and

Montreal.

Canada Metal Co., Ltd., Toronto.

Canadian Brass Co., Ltd., Galt.

Brass, Pipe and Tube.

James Robertson Co., Ltd., Toronto.

Pipe Threading Machinery.

Armstrong Mfg. Co., Bridgeport, Conn.

Nipples.

Page, Hersey Co., Ltd., Traders Bank Bldg, Toronto

Steel Co. of Canada, Montreal.

James Robertson Co., Ltd., Toronto.

Pipe, Black and Galvanized.

Page, Hersey Co., Ltd., Traders Bank Bldg, Toronto

James Robertson Co., Ltd., Toronto.

Steel Co. of Canada, Montreal.

Radiators.

Gurney Foundry Co., Ltd., Toronto.

Vici Radiator Co., Hamilton.

Pressde Steel Radiator Co., Pittsburgh.

Waldon Co., Ltd., Lumsden Bldg., Toronto.

Boilers.

Gurney Foundry Co., Ltd., Toronto.

Waldon Co., Ltd., Lumsden Bldg., Toronto.

Country Residence Equipment.

General Machinery Co., Ltd., Mulock Ave., Toronto.

Pumps.

Buckeye Pump & Mfg. Co., Columbus, Ohio.

General Machinery Co., Ltd., Mulock Ave., Toronto.

James Robertson Co., Ltd., Toronto.

Cluff Manufacturing Co., Ltd., Toronto.

Cluff Bros., Church St., Toronto.

Heaters.

Gurney Foundry Co., Ltd., Toronto.

Steel & Radiation Co., Ltd., Toronto.

The E. S. Manny Co., Montreal.

Warden King, Ltd., Montreal.

Soil Pipe and Fittings.

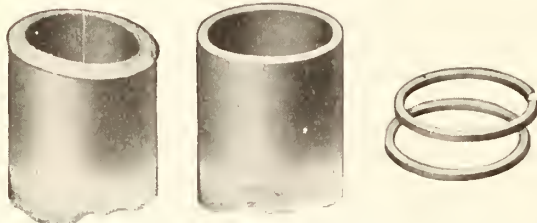
Antes Foundry Co., Toronto and Winnipeg.

John Wanamaker says that advertising doesn't jerk — it PULLS. He ought to know, and yet some men think that advertising should go against all rules and precedents and jerk them to success with one tremendous yank.

There'll be no burrs to ream out or file off if you use the Beaver Square End Cutter

**One Set
of Knives**

**No
Changing**



Done With Ordinary
Pipe Cutter

Cut With "Beaver" Square
End Pipe Cutter

It cuts the pipe off clean and preserves the full inside opening.

Makes a square pipe end on which threading dies start easier, last longer and run straight. It cannot split pipe.

It will cut off a piece of a threaded end right where it is threaded.

It works easier and quicker than a wheel cutter, and saves the extra time of reaming.

It is not strained by feeding too fast, because you do not feed it—simply close it up on the pipe. The feed is automatic—simply pull two handles, same as a die stock. The form of the knives regulates the depth of the cut. These are the features which make the Beaver Knife Cutter a successful, practical tool. The ordinary user does not cut enough pipe in a year to dull the knives. The largest users of Pipe have discarded wheel cutters in favor of "Beaver" Square-End Pipe Cutters, as all will do who try them.

Write for prices and references.



Borden-Canadian Co.

66 Richmond St. East
Toronto - Ontario

MOTT COMPANY, LIMITED

134-136 BLEURY STREET

MONTREAL, QUE.

Fine Grade
Plumbing Ap-
pliances in
solid Imperial
Porcelain and
Enamelled
Iron.

Baths, Lava-
tories, Kitch-
en and Pantry
Sinks, etc.

Hospital Sani-
tary Fixtures
and Equip-
ment.

Orna mental
Lamp Posts,
Display and
Sanitary
Drinking
Fountains.

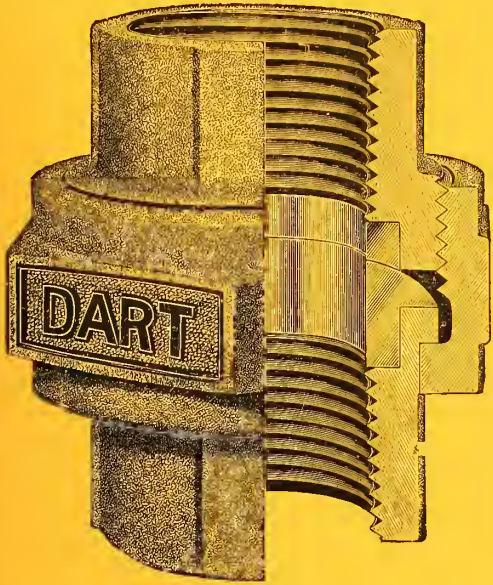


Mott's "Madison" Bathroom Fine Grade Fixtures at Moderate Prices.

If building,
send for our
complete cata-
logue showing
latest up-to-
date Plumb-
ing installa-
tions or call at
our show-
rooms and in-
spect the most
complete ex-
hibition of
sanitary
Plumbing ap-
pliances ever
made in
Canada.

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

SAFETY FIRST



When you put a DART UNION on the job it STAYS TIGHT till deliberately loosened with a wrench. There is no possibility of displeasing customers.

The BRONZE to BRONZE Ball-Shaped Joint never rusts or corrodes, and is easily connected whether pipes are in or out of line.

The trade-mark "Dart" is cast on the union.

Your jobber sells them.

Manufactured by Dart Union Co., Limited, Toronto, Ont.

KERR GATE VALVES

OUTSIDE SCREW AND YOKE

"KEYSTONE" PATTERN

Embody all the latest features



4 1/2-in. and larger

Screwed-in Seats

Deep Bronze
Bushed Gland
and Stuffing
Boxes.

Full Opening.

Large Diameter
Hand-Wheels.

Solid Wedge
Discs.



4-in. and smaller

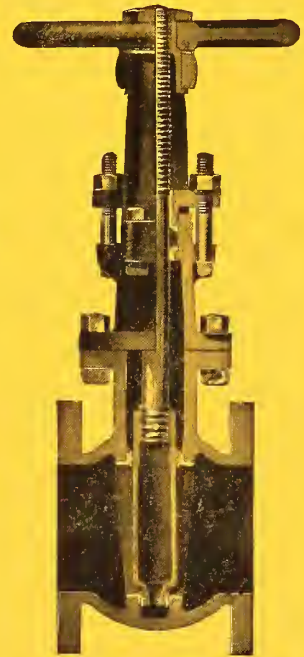
Narrow face-to-
face Dimensions

Symmetrical
Design.

Good Material.

Interchangeable
Parts.

Guaranteed
Tested.



4 1/2-in. and larger

Write at once for our new catalogue No. 5 and destroy all previous issues.

The Kerr Engine Co., Limited, MANUFACTURERS
Walkerville, Ontario

“RAPIDO”

(RAPID OPENING)

SINK BIBB

SET SCREW FLANGE



The design that will please your customers.
Plain Handle and Flange.
Encased Washer.
Anti Splasher.

“ADJUSTO”

Overflow and Waste Tubes
Telescope



*“Use Adjusto when in a hurry,
Saves half the time and all the worry.”*

Any article of our make proving defective through inferior metal, or improper workmanship, on our part, will be replaced with TWO good ones, at NO CHARGE to you.

GALT BRASS

Galt, Canada



THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

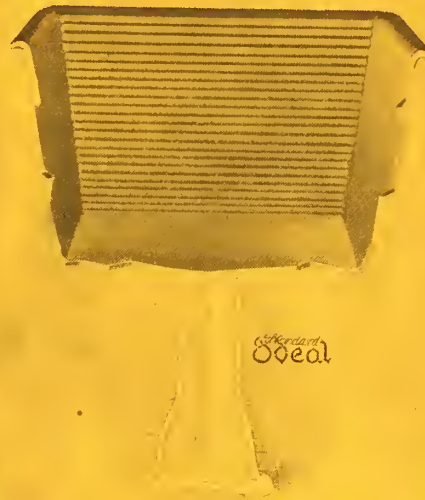
THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

Publication Office : TORONTO, JULY 1, 1914

No. 13

"HERCULES ENAMEL" LAUNDRY TRAYS With "Cast-In" Washboard



A NEW IDEA—A NEW ENAMEL—A LAUNDRY TRAY WITH A TRANSPARENT ENAMEL AND A WASHBOARD CAST IN THE TRAY.

"Hercules Enamel" is the Ideal Enamel for Laundry Equipment. It is more durable than white porcelain enamels, and will not chip, crack or craze.

The Cast-in Washboard is a feature of these trays. The old-fashioned Separate Washboard is very inconvenient and unsatisfactory; it must frequently be repaired or replaced. In the new "Hercules" the Washboard is there forever.

It's New—It's Practical and Durable and—It's Cheap. Write for circular and prices.

MADE ONLY BY

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

TORONTO
119 King St. East

MONTREAL
42-44 Beaver Hall Hill

WINNIPEG
76-82 Lombard St.

VANCOUVER
410 Carter Cotton Bldg.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

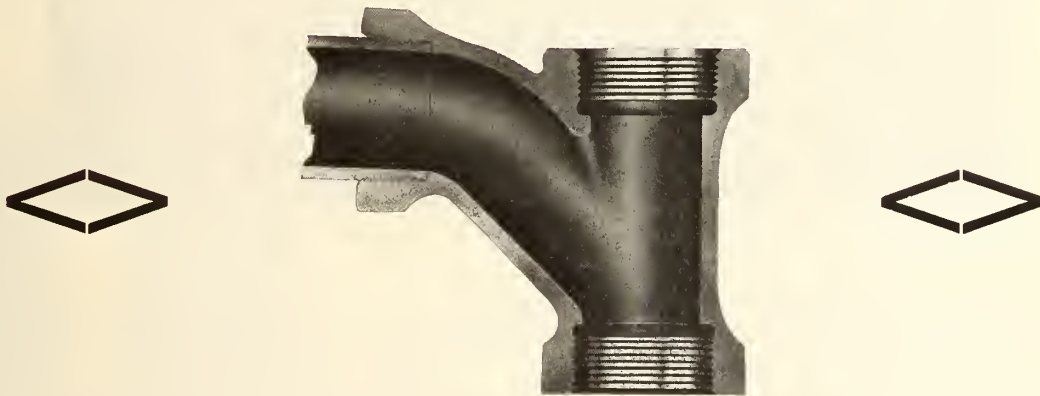
ONTARIO:
Monarch Brass Mfg. Co.,
178 Victoria St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes,
120 Lombard St., Winnipeg

BRITISH COLUMBIA:
A. O. Campbell,
864 Cambie St., Vancouver

RECESSED DRAINAGE FITTINGS

**We are now Manufacturing
a complete line**



FITTINGS LIMITED OSHAWA

MONTREAL

WINNIPEG

VANCOUVER

“Standard Sanitary” Plumbing Fixtures



“Standard Sanitary” Bathroom of Queen Victoria of Spain.

The above cut was made from a photograph of the fixtures actually installed in the Royal Palace of La Magdalena, Santander, Spain, the summer residence of their Majesties, the King and Queen of Spain.

A similar bathroom was also installed for the King, and eighteen other complete “Standard Sanitary” Bathrooms for the other members of the household.

This is an extremely practical and beautiful interior and combines with beauty and refinement every modern sanitary idea.

The fixtures are set into the tiling, thus offering no place for dust or moisture to collect, and reducing cleaning labor to a minimum.

The Foot, Sitz and Shower Baths make an unusually complete and artistic bathroom at a cost that is very reasonable, considering the quality of fixtures shown.

“Standard Sanitary” plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales-agents throughout the Dominion.

Standard Sanitary Mfg. Co., Limited

General Offices and Factory:

ROYCE AND LANSDOWNE AVES., TORONTO, ONT.

Toronto Store:

55-59 Richmond Street East.

Hamilton Store:

20-28 Jackson Street West.

“When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.”

THE DAISY BOILER

Over 55,000 DAISY Boilers

are giving the best of service throughout Canada.

The Daisy has qualities which make it a better proposition than any other on the market.



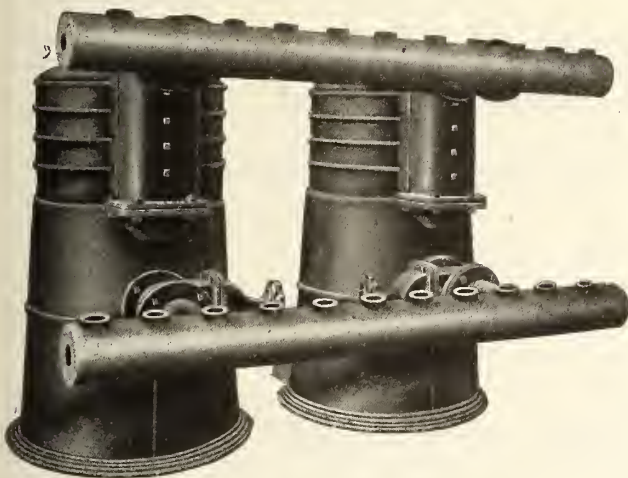
Made in the best equipped plant in Canada.

Without doubt the most popular boiler made.

Every installation means another customer satisfied.

Minimum consumption of fuel.

Maximum amount of heat.



Rear view of two Daisy Boilers connected with twin headers. This system gives great satisfaction in mild and extreme weather.

WARDEN KING LIMITED, MONTREAL

BRANCH, 200 Adelaide St. West, TORONTO

AGENTS:

The CRANE & ORDWAY CO., WINNIPEG, MAN.
The MECHANICS' SUPPLY CO., Limited, QUEBEC, P.Q.
The JAMES ROBERTSON CO., Limited, ST. JOHN, N.B.
The WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

It doesn't cost

us much more to make **SYDENHAM** goods than it does to make the cheaper kind, and it certainly pays to use them on every job when the **best** is required and your **reputation** is to be maintained.

EVERY PIECE
GUARANTEED

Sold by jobbers from
coast to coast

Made by
**THE WALLACEBURG BRASS & IRON
MANUFACTURING CO., LIMITED**

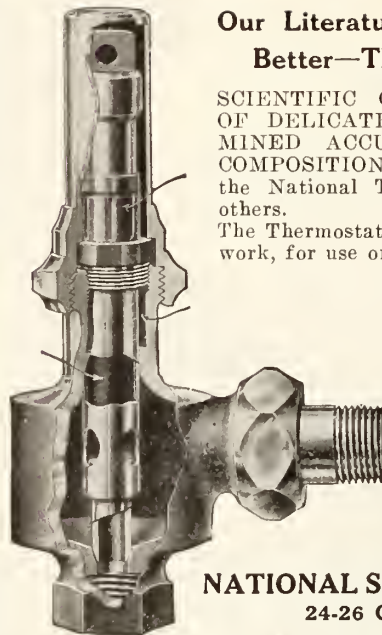
WALLACEBURG, ONTARIO

Winnipeg,
Moncrieff & Endress, Ltd.
Scott Bldg.

Toronto,
L. N. Vanstone,
8-10 Wellington St. E.

Montreal,
J. R. Devereux
142 St. Joseph Boulevard West

National Valves. Scientifically } Economically } Correct Usefully }



Our Literature Tells Why They're
Better—Their Use Proves It.

SCIENTIFIC CONSTRUCTION—ABSENCE OF DELICATE PARTS — PRE-DETERMINED ACCURACY — BRASS-ENCASED COMPOSITION—all of these are features of the National Thermostatic Trap—there are others.

The Thermostatic Valve is adapted to various work, for use on Vacuum Systems, Dry Kilns, etc., etc., and is guaranteed for 5 years.

If you want Perfect Service, based on perfect valve principles, the National Thermostatic Valve will answer this purpose.

Write for our literature on the complete National Line, such as the B Heat Intensifier, B Pipe Joint Compound, "Perfection" Radiator Fitting, etc., etc.

NATIONAL STEAM SPECIALTY CO.

24-26 Clinton St., Chicago

Surpless, Dunn & Co., 74 Murray St., New York
L. N. Vanstone, 8 Wellington St. East, Toronto
Moncrieff & Endress, Limited, Scott Bldg., Winnipeg

300,000 lbs.

carried in stock for immediate
shipment of

Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

Brass and Copper Rod.

Brass and Copper Sheet.

WRITE US FOR PRICES

Tallman Brass & Metal Co.
HAMILTON, ONT.



Jim Hill--the railroad builder--said "invest in a country where they wear overcoats."

That means Canada.

What he meant was that the people in a country where it gets cold sometimes have a "punch" that you don't find in the tropics. Imagine trying to sell heating apparatus to a Fiji Islander!

Or plumbing either!

Perhaps it is the **Demand** for plumbing and heating appliances that has kept us continually planning better methods and more efficient ways to heat and "plumb" a house.

Canada leads the world (with the exception perhaps of one other country) in the matter of advanced plumbing and heating appliances.

Canadian Plumbers and Steamfitters have the best goods in the world to offer their customers.

I won't take the responsibility of saying why this is: perhaps it is because "we wear overcoats" in the winter, and "no coats at all" in the summer; perhaps there is some other reason. But there you have it. And since I have been with the Gurneys (since 1843), we can claim, I think, to have done our share in putting Canada on the map, so far as heating and plumbing goods are concerned.

SAM OVEN,
with the Gurneys.



The Gurney Foundry Co., Limited

ESTABLISHED 1843

TORONTO, CANADA

Hamilton London Montreal Winnipeg Calgary Edmonton Vancouver

SOMETHING

NEW

THE GEYSER
AUTOMATIC
WATER HEATER

is composed of a vertical cylinder from four to six feet long, according to size. The cylinder contains brass pipes which receive the steam and transmit heat to the water. These pipes are screwed to the base chamber, but remain independent from one another at the top, consequently, the expansion is entirely free, and leaks are impossible.

FULLY GUARANTEED
MANUFACTURED BYTHE E. S. MANNY CO.,
MONTREAL

PERFECTION FLOOR AND CEILING PLATES

300,000 always on stock.
Sizes from $\frac{3}{8}$ to 4 in.

The most popular plate is our No. 10 Hinged Press'd Steel or Brass. We manufacture all lines shown on cut.

The BEATON & CADWELL MANUFACTURING CO.
New Britain, Conn.

Eastern Agent: J. R. Devereux, 142 St. Joseph Boulevard West, Montreal.
Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

WOLVERINE

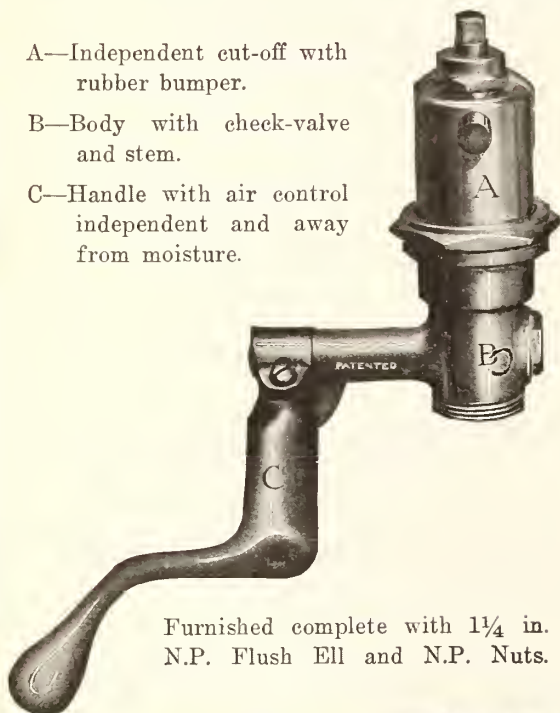
QUALITY

Wolverine Flush Valve

PATENTED

Durable - Inexpensive - Economical - Simple

- A—Independent cut-off with rubber bumper.
- B—Body with cheek-valve and stem.
- C—Handle with air control independent and away from moisture.



Furnished complete with $1\frac{1}{4}$ in. N.P. Flush Ell and N.P. Nuts.

The only Direct valve on the market. No small by-passes to stop up or corrode and each valve is furnished with independent cut-off with rubber seat bumper.

Flush can be adjusted without shutting off the water.

For Direct pressure or gravity systems. Write us for price and further information.

Manufactured and guaranteed by

Canadian Wolverine Co.
LIMITED

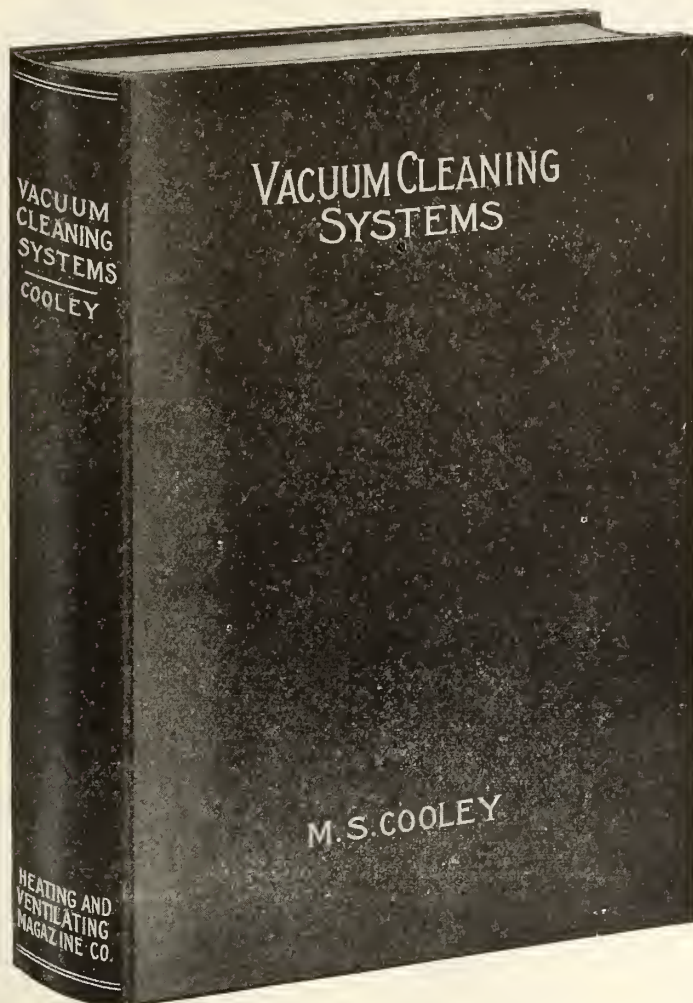
Chatham, Ont.

EVERY ARTICLE

GUARANTEED

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

Have you got your copy yet?



Vacuum Cleaning Systems

By M. S. COOLEY

Mechanical Engineer,
Office of Supervising
Architect, Treasury
Department, Washing-
ton, D.C.

*244 pages, 6 x 9 inches.
105 Illustrations. 20 Tables.*

PRICE, POSTPAID, \$3.15

The first full and authoritative treatise on the art of vacuum cleaning. Contains all of the author's important tests of vacuum cleaning apparatus, history of mechanical cleaning, requirements of an ideal vacuum cleaning system, together with chapters on the carpet renovator, other renovators, stems and handles, hose, pipe and fittings, separators, vacuum producers, control, scrubbing systems, selection of cleaning plant, tests, specification and portable vacuum cleaners.

A Book for Sanitary and Heating Engineers, Architects, Engineers and every person interested in the correct installation of mechanical cleaning plants of any kind.

TECHNICAL BOOK DEPT.

MACLEAN PUBLISHING CO.

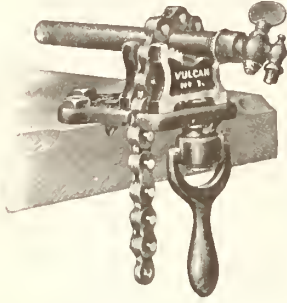
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143 UNIVERSITY AVE., TORONTO

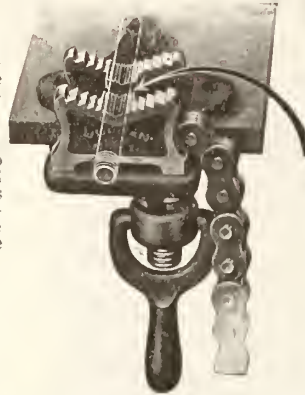
"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

Williams Unusual "VULCAN"!



BECAUSE "VULCAN" Vises are unbreakable in service.

BECAUSE no other vise will hold irregular shapes as well. Either Fittings or Pipe are "meat" for the "VULCAN."



BECAUSE if you wish to bend pipe, no other Vise will help as much. Use an eye-bolt in one of bolt holes for "staying" the pipe.

BECAUSE if you don't want to bend the pipe no other tool will prevent it in a better way — see the extended teeth on jaws (No. 1 size) and the "wrapping" contact of chain.

3 sizes, capacities $\frac{1}{8}$ to 8" pipe.



Send for Dependable Chain Tools Pamphlet or consult your dealer.

J. H. Williams & Co., Superior Drop-Forgings 77 Richards Street, Brooklyn, N.Y. City.

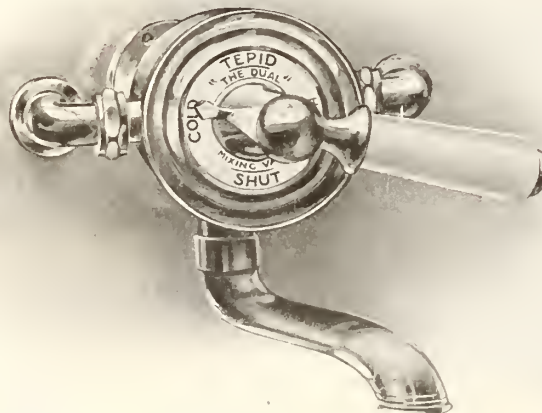
THE "DUAL" VALVE

The
Finest Industrial
Bath Installation in
EUROPE

is at

Messrs. Brunner
Mond Co.,
Northwich, Eng.

where 2000 employees are provided for by these mixers.



Strong and well built, made to stand hard usage.

It can be taken to pieces without disturbing connections.

Made in various types for baths, lavatories, showers, etc.

Send for descriptive booklet.

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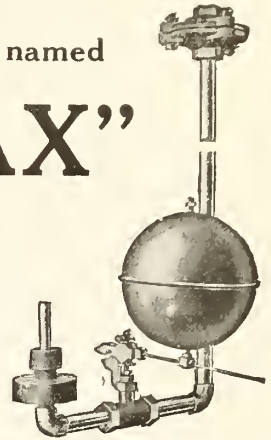
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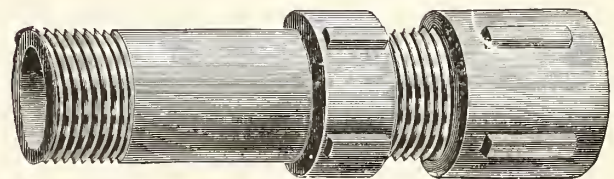
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SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, JULY 1, 1914

No. 13

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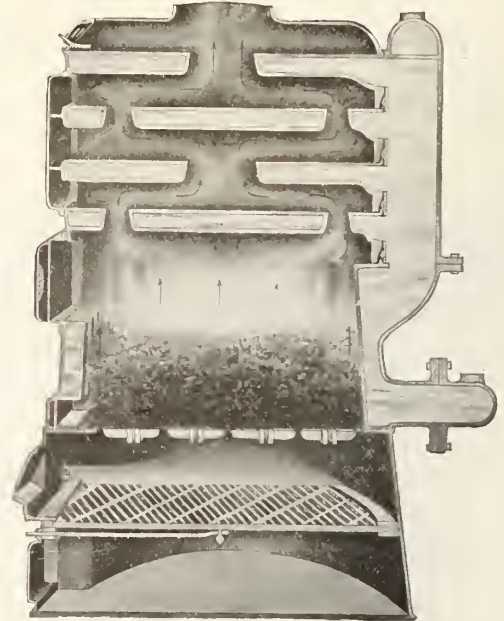
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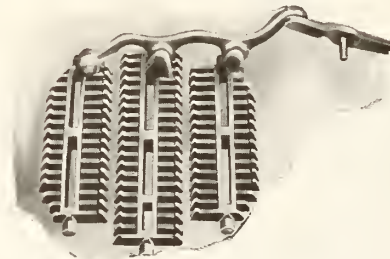
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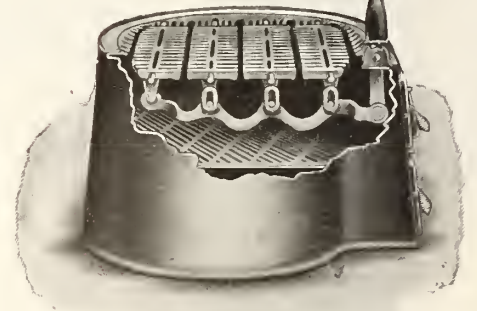


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THE SANITARY ENGINEER

VOL. VIII.

JULY 1, 1914.

No. 13

Methods of Sewage Disposal in Canada

Showing That the Disposal of Sewage in Canada is a Subject Which Cannot be Copied from Other Countries, Because of the Varied Climatic Conditions Which Prevail, in Fact, Different, One Method May Be Satisfactory in One Part of Canada and Not in Another.

*By T. Aird Murray, M. Can. Soc. C.E. in Contract Record.

DURING the last six or seven years "sewage disposal" has become an important and much-talked-of problem in Canada, but even at this date, in spite of the advertising which the subject has had from the action of the provincial and other health authorities, very few people appear to have any but a hazy knowledge of what the problem really calls for.

Those who are connected with municipal government are recognizing that a new factor is rapidly developing in civic administration and that the construction of sewers can no longer be accompanied by the simple and economic expedient of discharging the raw sewer contents into the nearest natural drainage location which presents itself. Works of sewage disposal are being demanded by most provincial health authorities before legal sanction can be obtained for raising money by debentures for constructing new sewers, and in many cases communities are being notified that they will be required to install sewage disposal works in connection with several systems of old standing. As a rule the layman has some difficulty in mentally materializing exactly what this demand means, not only with reference to cost and construction, but more particularly as to what one can reasonably be expected to do with sewage in order to produce satisfactory results.

The Meaning of Sewage Disposal.

The term "sewage disposal" has come to mean something more than the mere disposing of sewage. It implies that some method of treatment be included by which the disposal of sewage shall not be accompanied by any nuisance either to the community producing the sewage or to any neighboring community which may be affected by the disposal. In brief, "sewage disposal" implies the construction of certain works

calculated to alter the original character of the raw sewage, either by weakening it or changing its chemical character.

Sewage represents practically the water supply of a community after it has been used for cleaning purposes, flushing and carrying away the major portion of human and animal waste products. Sewage, therefore, chiefly consists of water, but the water contains varying amounts of organic matter in the form of suspended solids—solids in solution, and as chemical compounds, mineral matters and also numerous forms of bacteria, many of which are connected with specific diseases capable of transmitting infection. The development of the "water carriage system" by means of underground sewers for the removal of sewage, or "domestic drainage" entailed the concentration of sewage at the lowest topographical elevations, generally represented by a water-course or lake. Thus the custom developed in Canada, as elsewhere, of utilizing water-courses and lakes for the reception and disposal of sewage. The organic contents of sewage commence more or less rapidly to change in character immediately they are mixed with water. By processes known as putrefaction, fermentation and oxidation, the organic matters in sewage are gradually resolved into their elementary mineral constituents. The process of change from organic to inorganic takes place partly in the sewers and more particularly in the water-course or body of water eventually receiving sewage. When the proportion of water to organic matter is below a certain volume, foul odors from liberated gases result from putrefactive processes. Putrefactive processes, however, do not take place where there is a sufficient dilution of water to provide enough dissolved oxygen to oxidize the organic matters.

When dead or effete organic matter is mixed with water, the dissolved oxygen present in the water is gradually ab-

sorbed and not until it is absorbed does putrefaction take place. Domestic sewage entering a stream does not poison fish, but the sewage may be of such a volume as compared to the stream that the dissolved oxygen is used up and fish life made impossible. The process of sewage putrefaction taking place in a stream may render that stream as objectionable as an open sewer—foul-smelling, void of fish life, abhorrent and dangerous to cattle, and generally providing a nuisance very apparent to the senses. The same apparent nuisance may arise even when sewage is discharged into a large body of water, when the sewage is concentrated in a stagnant dock, bay or portion of the body of water not subject to currents or any cause producing dispersion. It is safe to say that Lake Ontario is capable of oxidizing the organic matter of the sewage of many million people, but it is not safe to say that Lake Ontario can be utilized for that purpose, but only probably a very small area of the lake contiguous to the location of the point of sewage discharge. It is apparently very difficult to dispose or mix a volume of sewage with a large volume of water. The author has found areas of sewage-polluted water almost intact with lines of demarkation ten or twelve miles from Toronto Bay. It is more practical, at times, to disperse or mix sewage to the point of desirable dilution in a flowing river than in a lake.

The Esthetic and Sanitary Nuisance.

The obvious nuisance due to odors, etc., from putrefactive processes when sewage is mixed with water is not the only or even the most important one. The study by bacteriologists of sewage-polluted waters has proven beyond all doubt that the infective bacteria which accompany sewage will continue in water long after the organic matter has apparently disappeared, and may be present even when the water appears as

*Of Messrs. Aird, Murray and Lowes, consulting municipal engineers, Toronto.



LETHBRIDGE DISPOSAL WORKS.
Sludge separator tanks and filters under construction.

pure and sparkling as a glass of spring water. It is a demonstrated fact that the organic matter in the Buffalo sewage is mineralized in the passage down the Niagara River to the mouth, but that the water remains infected with colon bacilli.

The question of nuisance is a two-fold one. That which is apparent to the senses may be termed "esthetic" and the other "sanitary," the latter having a direct relation to health and the transmission of disease. It must be apparent that the amount and character of any sewage treatment may be subject to either or both of the above factors of nuisance. In the case of discharging sewage into tidal waters, neither of the above factors may apply. In the case of a small stream receiving sewage the water of which is not afterwards used for domestic purposes, the esthetic nuisance may be the only one requiring attention. On the other hand, with a large river, the proportion of dilution may be sufficient to obviate any esthetic nuisance, but the sanitary nuisance may be of a very grave and important character as in the case of the Niagara, the Ottawa, St. Lawrence. Saskatchewan and other large rivers, which are utilized for domestic water supply.

Sewage Disposal With Reference to Canadian Conditions.

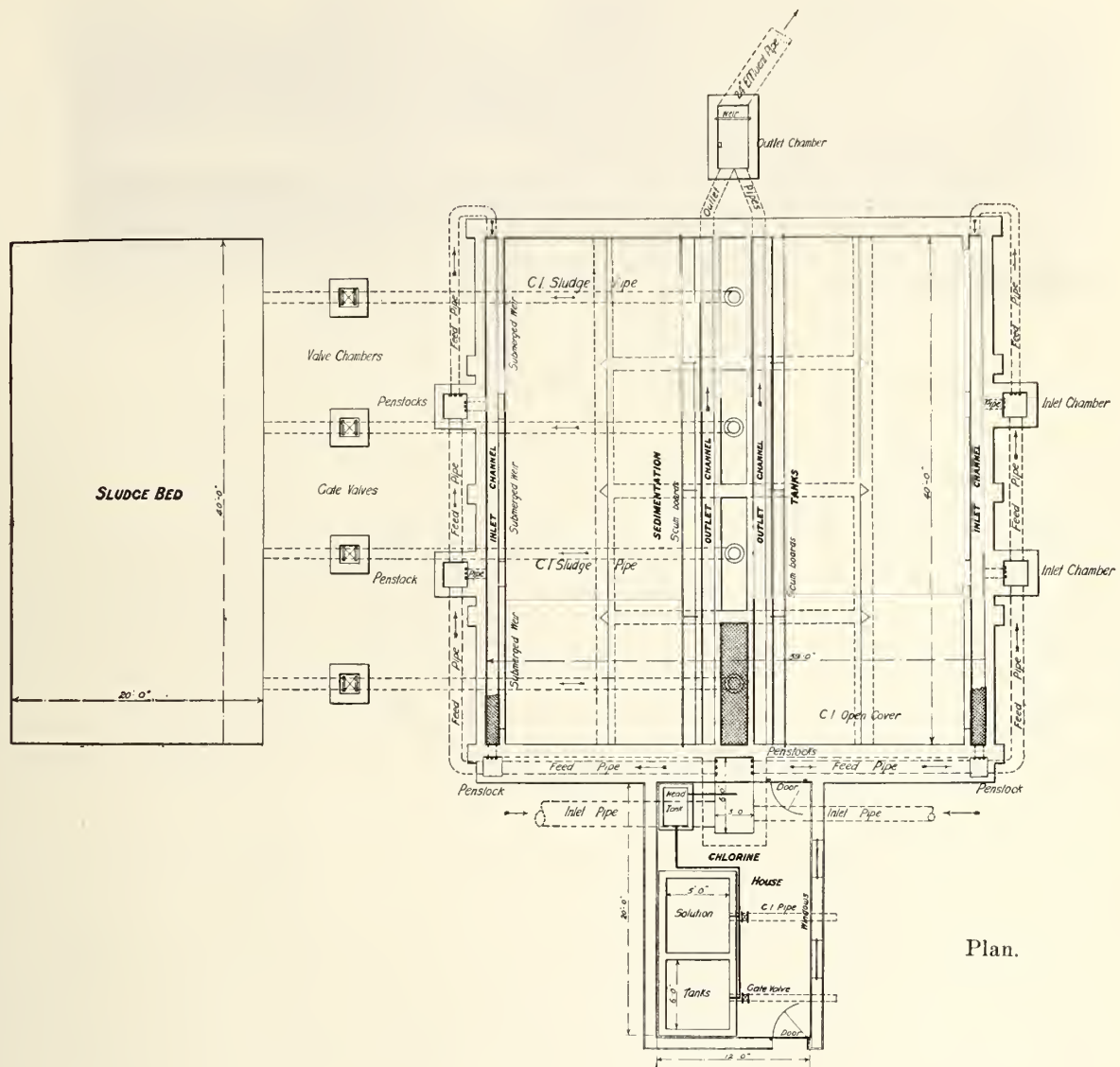
The amount and even character of sewage treatment is not by any means a fixed factor of general application. There is no one defined complete system of sewage disposal which is the only or the best system capable of general adoption. Sewage treatment cannot be unified in the form of an exact machine, subject to exact cost per capita either for capital or operation charges. A

system of a particular character may be efficient under certain conditions meeting certain defined requirements; however, allowing different conditions and requirements, the same system may be either efficient or a wanton waste of money. Local conditions, character of sewage with reference to trade effluents, etc., amount of treatment required, character of stream or body of water receiving the sewage, topography, locality and site for works are all determining factors upon the choice of any particular method and amount of treatment. It is not surprising then to find that the layman is at some trouble in arriving at an understanding as to what sewage disposal really means. The elasticity of method with reference to meeting varying requirements is the reason for this branch of engineering being specialized and confined to the judgment of experts trained particularly in the work. It is difficult to estimate the proportionate value of chemical and engineering knowledge required in order to produce an efficient system of sewage disposal to meet any one set of special requirements. Certain it is, however, that the chemist has done much of late years to explode many unsound theories and put the subject upon a more scientific and certain foundation. The research and experimental work which is being done by many of the health officers and chemists connected with the provincial governments of Canada is having its effect already in producing a very advanced and efficient class of work compared with the old, so-called, "septic tank," which up to within a few years ago was considered by engineers and the people generally as the whole thing in sewage disposal.

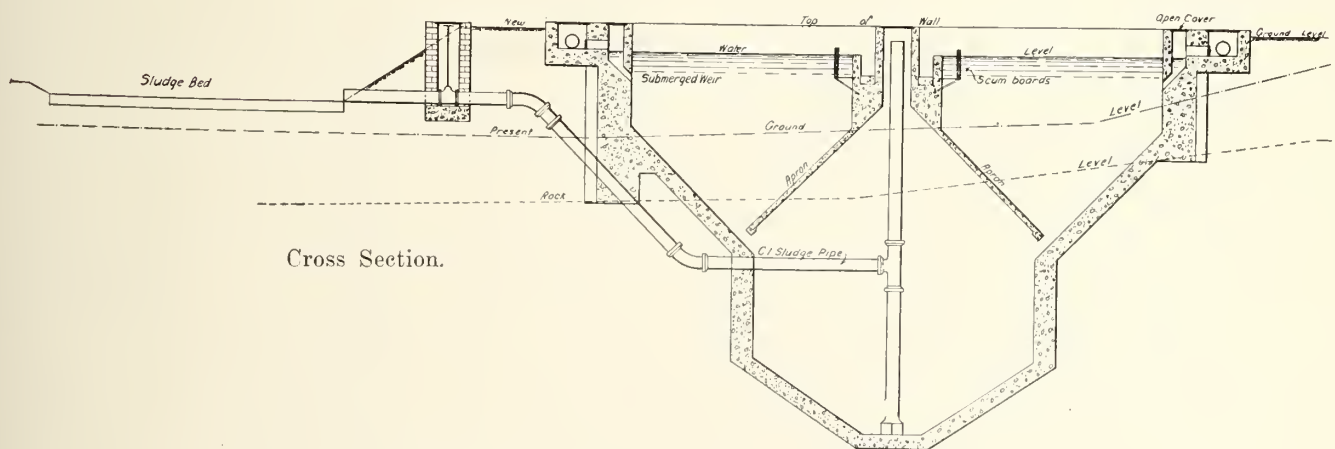
The Canadian Society of Civil En-

gineers appointed a committee in 1910 to investigate the question of sewage disposal with reference to the pollution of lakes and streams in Canada, and a report was submitted at the annual meeting in 1911. The committee addressed a list of questions to 327 places in all, with the result that the Maritime Provinces, Quebec and Manitoba reported no sewage disposal plants. British Columbia reported one place with septic tank treatment. Ontario reported nine places with septic tank treatment only, four with septic tanks and bacteria beds, one intermittent sand filter, and one with treatment on land. Saskatchewan and Alberta each reported one place with septic tanks, and a few places at which modern processes were contemplated at an early date or actually under construction. Since 1910, Alberta, Saskatchewan and Ontario have seen the completion of several up-to-date completed sewage disposal works and several other works are under construction or are proposed at the present time.

It may be taken that public opinion in Canada is in line with reference to the advisability of non-infection of inland waters with sewage bacteria. Several remarkable typhoid epidemics occurring in cities and towns within the last few years have been demonstrated to result directly from the use for domestic purposes of sewage-polluted water. Montreal, Ottawa, Toronto, Fort William and Sarnia have suffered terribly in the past, while the death rate per 100,000 from typhoid throughout the Dominion has been about six times greater than in Great Britain. The use of calcium hypochlorite during the last three or four years in connection with many known polluted water supplies has done a great deal to reduce typhoid. At



Plan.



Cross Section.

SLUDGE SEPARATOR TANKS AND CHLORINE HOUSE.



SEWAGE DISPOSAL WORKS, WESTON, ONT.
Sludge separator tanks and filters covered in.

the same time, there appears to be a general feeling of exasperation that the use of chemicals should be necessary in order to provide safe water supplies. That "prevention is better than cure" is a sound axiom, and will always be a popular one. Wherever provincial boards of health have taken up the subject of prevention of pollution of water supplies with sewage, their efforts have, generally, been popular with the public. In cases, however, of interprovincial and international waterways, provincial governments have met with a difficulty in administering laws regulating pollution. For instance, the laws with reference to the restraint of sewage pollution are much more effective in Ontario than in Quebec. Ontario can only administer on one side of the Ottawa River, the other side being controlled by Quebec. In connection with our international boundary waters, towns and cities on the Canadian side hesitate to spend money in sewage treatment works unless there is some guarantee that the towns and cities on the American side follow suit.

Evidence that popular opinion is directed to the above conditions is apparent in the fact that the Parliament at Ottawa are directing their attention to the framing of Dominion legislation calculated to prevent the pollution of interprovincial rivers, while the "International Waterways Committee" have been asked by their respective governments to advise as to what measures should be taken jointly to prevent the pollution of boundary waters. It is understood that a large amount of evidence is being collected which points to the necessity of immediate action, and municipalities may anticipate with certainty that it will shortly become a civic crime to utilize inland waterways, such as streams, rivers and lakes, for the purpose of sewage purification. In the great

majority of cases, sewage will have to be treated not only to obviate the esthetic nuisance, but further to eliminate or destroy the sewage bacteria. The statement that cities and towns may filter and chlorinate water supplies will not serve as an answer to the general demand for prevention in the first instance, because it will always be impossible to filter and chlorinate all water supplies taken by individual farmers, used for stock and dairy farming purposes, used by the summer cottages and the lake or river floating population. It is an indisputable assertion that if the domestic sewage which now discharges by means of underground sewers direct into streams, rivers and lakes without any form of treatment were treated to the extent of the elimination and destruction of the sewage bacteria, at least fifteen hundred lives could be saved annually in Canada from death by typhoid alone, and this only entails cutting the typhoid death-rate by one-half, yet practically leaving it double that of Great Britain.

British and Canadian Conditions Compared

The elimination of sewage bacteria or the prevention of the "sanitary nuisance" is of more importance in Canada than in Great Britain, and British methods of "sewage disposal" are only partly applicable to this country. In Great Britain, water supplies are not generally taken from sewage-polluted sources, but from upland surface collecting areas devoid of population. The chief purpose of sewage disposal in Great Britain is to avoid the esthetic nuisance and to preserve fish life. The chief purpose of sewage disposal in Canada is to avoid the sanitary nuisance and to preserve our water supplies as pure as possible from sewage infection. Canada is dependent upon its lakes and

rivers to a great extent for water supply. Continued droughts, comparatively speaking, low average rain precipitation, hot sunshine in the summer months, tending to algae growths in impounded waters, ice covering in winter, retaining the gas products of decaying vegetable growth, are all factors which put our water supply conditions on an entirely different footing from those of Great Britain, and in many cases dictate a method of sewage treatment in advance of that generally accepted in Great Britain. For example, the Rivers Don and Humber, near Toronto, with their extensive water-sheds, would be large rivers in Great Britain, with its generally impervious surface strata and high average rain precipitation. These rivers with their large collecting surfaces would form ideal catchment areas for the impounding of water, which under British climatic conditions would vary only slightly in temperature and show decided improvement in the quality of the water the longer it was stored, allowing of sedimentation and exposure to the oxygen of the atmosphere. But practically only during the spring freshets and melting of the snow and ice is there any water to speak of flowing in these rivers. During the summer months they are practically a succession of stagnant pools, the summer rains being absorbed by the friable sandy soil of the uplands and never reaching the river courses. It is for the above and other reasons that Toronto cannot depend upon its water-shed to the north for water supply, but must utilize Lake Ontario water, which in turn receives the sewage of its whole population. Toronto is face to face with the problem of destroying the sewage bacteria before the sewage enters the lake.

(Continued in next issue.)

Problems in Sheet Metal Work

By E. Bronson.

AMONG the many and varied articles made in the tinshop are dripping or bake pans and ash pans similar to those shown in the accompanying drawings. As articles of this nature are of such a simple thing to draw out patterns for, they are seldom or ever run over for practice. Still, however, we submit them in the hope that even if well known, they may possibly be brought to the attention of the boys or improvers to whom they will be helpful.

In the pan shown in Fig. 1 we have what is generally known as a dripping pan or bake pan. The particular idea or point to keep in view in making a pan of this nature is that the corners are lapped or folded in such a way, that even though nearly full of any hot liquid, they will not leak.

To construct pattern it is necessary first to lay out an end and side view of at least one corner of the pan in order to get the slant height of sides and ends. As is well known, the end view gives the correct measurement of sides and the side-view the correct measurement of ends. In Fig. 1 let A, B, C, D be end view of

pan, and E, F, G, H, side view. Draw a square or oblong equal in width and length to C-D and G-H continuing lines out some distance or at least equal to depth of sides and ends of pan from the ends O-M and P-N mark out a distance equal to the slant height of pan as shown in side view by E-G and F-H, and from O-P and M-N on sides mark out side as shown by A-C and B-D in end view. From the point where the dotted lines from P-O and M-N meet line R-S and T-V mark out the difference in width between top and bottom of pan, as shown by X in end view, connect points R-S and T-V. From the points where lines carried from O-M and P-M meet lines K-L, mark out the difference in length between top and bottom of pan as shown by Z in side view, connect points K and L to O-P-M and N. This concludes the pan itself, there still remains the lap on the end. Repeat instructions from here when developing Fig. 2.

As the four corners are all the same we will only deal with one. Connect points V and L with line, and from its centre, I, as shown draw a line from bot-

tom corner N, carrying it out an inch or so, with point of compasses at N as a centre and N to I as a radius, strike an arc on end of pattern, with V as a centre and V-I as radius strike an arc cutting one struck from point N. Connect N and V to this point, by carrying line from N on until it meets top of pattern, the distance from N to top of pattern is the length required on line N-I. Connect V and L to this point and it will make lap on corner of right size to finish even with top of pan.

No allowance is made in this pattern as this is fixed by the size of wire used in making pan.

The method of getting pattern of corner, can be done with square by placing square along lines N-I-V and noting distance from N to I and I to V, then placing square on opposite side of line N-V and mark along edge of square, the point of square will meet same point as the two arcs in previous method, then with rule or square, measure the extra distance required and place on line N-I. Thus getting same results.

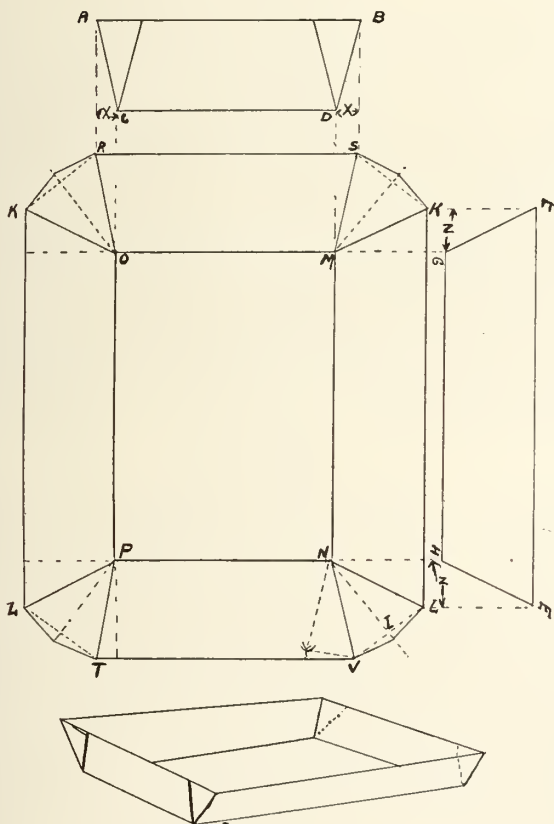


FIG 1.

C.S.O.

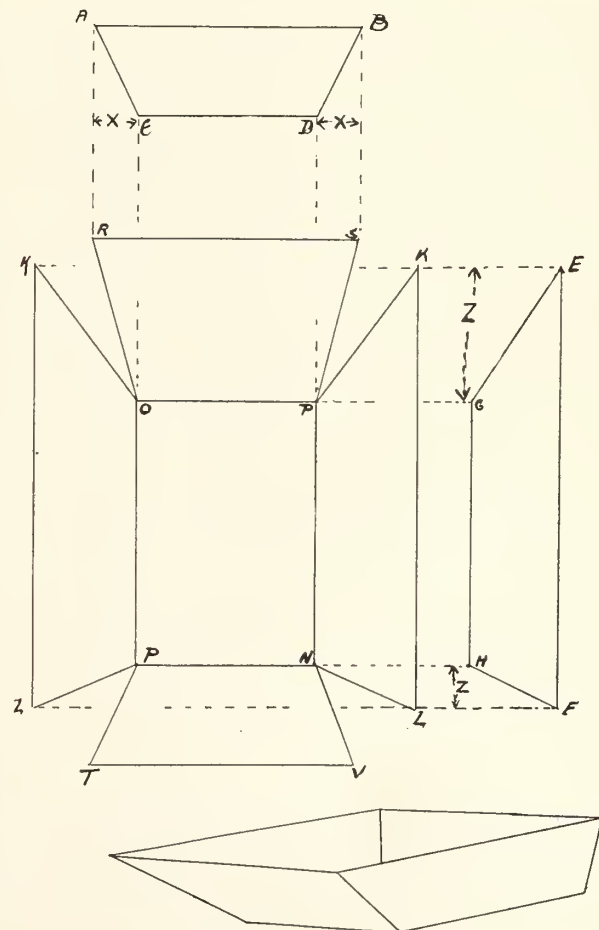


FIG 2.

C.S.O.

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Plumber and Steamfitter of Canada

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TORONTO, JULY 1, 1914

THE AD CLUBS CONVENTION.

LAST week saw several thousand hard-headed and sincere businessmen gathered together in convention in Toronto. These men are businessmen in actual fact. They are making good. They stand for truth, in advertising as well as in manufacturing. To be an Ad Man and belong to the Associated Advertising Clubs of the World means that you are willing to be put under the test, that what you say is true, what you make is right, and that you are prepared to have the searchlight of sincerity put upon you, that you are giving or intend to give one dollar of value for one dollar in cash. Ad Clubs are made up of men who are going to deal the death blow to fakes, of every description. If you are not prepared to give your customer a square deal the Ad man will be after you and make you. Not only will you be required to give your customer a square deal but you must also give yourself one too. Those who were fortunate enough to listen to some of the messages spoken or read at the recent Ad Clubs Convention cannot help but be impressed with the ring of truth, honesty and sincerity which resounded throughout the whole of the sessions and such sentiment should be upheld by sanitary and heating engineers.

Sanitary and heating engineers have been and are to some extent laboring under public suspicion, because there are too many fakes at the business. Those who are giving a square deal should get out and show the difference between the faker and the honest craftsman. If in a matter of ten years the various businessmen can form ad clubs and muster upward of 5,000 delegates to attend a convention, why should not sanitary and heating engineers not muster up a greater number than they do at their conventions? Why, let us ask? Simply because they are not sincere enough with one another. They do not trust each other. Oh for the day when the sanitary and heating engineer's 'yea will be yea' and his 'nay be nay,' but we must not continue in such a lamenting strain. There is hope for better conditions. The recent national convention held in Ottawa, breathed greater hope, greater desire to better conditions and even at this early date there is a feeling abroad that great results will be the order of the day on account of things which were said and done in Ottawa.

GO FURTHER AFIELD FOR BUSINESS.

IT IS a well-known fact that business on the whole is not too busy with sanitary engineers just now, nor will there be the same amount of work as has been the rule for the past few years. Therefore, considering such a fact,

it behooves those engaged in this calling to look further afield and, as it were, create new business or shall we say establish new fields for business?

There never was a time when farmers or persons owning rural homes were more interested than now in having city comforts and conveniences, and why should they not have these conveniences, let us ask? In a recent issue of **The Sanitary Engineer** we stated that those residing in rural districts could in actual fact, reside in more sanitary environments than those of a city, and here is the new field for sanitary engineers. The sanitary engineer should take a drive out to some distant locality and begin with the first person he meets as it were. Tell that person his business and ask if he would like to have all the comforts of a city home. Then show him how it can be done. Get down to brass tacks and show the approximate cost of such installations. It seems a farce to think that those residing in our rural districts, where homes are not congested, should be laboring under such disadvantages as having to heat their houses with stoves, carry water, use privies and have a score of other unsanitary conditions prevailing.

None are so able to afford the very best as those who reside in rural districts. Look at it which way you may. Land is cheaper, houses can be built for less money, labor is cheaper, whereas in a city the top price is charged for everything, rents are higher, land is costlier. It is therefore easy to be seen that sanitary engineers, who are feeling the dearth of business, should go further afield and look up new business which is waiting for them. They would not seek in vain.

ANOTHER NECESSITY.

THERE is another field of operation for sanitary engineers and that is the fact that more public comforts be located throughout our cities, towns and villages. Doesn't it seem a crying shame that there are so few public comforts in our streets? There are hundreds of play parks, and other parks where such conveniences should be located. There are also scores of vacant lots which could be acquired for this purpose. These places are a necessity. They are far more necessary than public drinking fountains and of the latter there is not half enough. The writer was speaking to a medical man recently about this matter and, during the conversation, the latter stated that thousands of people were suffering from various diseases as a direct result of the need for such public conveniences, and even if a person were strong enough to withstand the need, the strain on one's physical

self was cause for untold suffering. Further, the lack of a sufficient number of such public conveniences is often the cause of many a young man going to the bar room or hotel, because the owners of such places are forced to have such accommodation. Why should the public take advantage of these conveniences which are meant to serve only those who frequent such places? All such measures as the advocating of more public comforts can best be handled by sanitary engineers and without doubt they would have the voice of the medical faculty and the people behind them.



WHY BOND SANITARY ENGINEERS?

SEVERAL Canadian towns and cities are at present remodeling their plumbing by-laws, and several associations are asking that there should also be a by-law governing those who install sanitary and heating apparatus. These men are asking that every man engaged in the trade shall pass an examination as a proof of his capabilities, and several members of the craft are advocating the necessity for a bond being furnished for those installing such work so as to safeguard the public in the event of poor work being done or inferior material being installed. Some object to a bond being given on the ground of it being a hardship to them. Let us state right here that the person who cannot procure a bondsman or furnish one himself has no right to expect to do business with a trusting public, and it is high time that sanitary and heating engineers saw the necessity of some such method being adopted. Let us analyze such a statement. First, if a sanitary engineer is called upon to execute a certain job and the public know full well that every person doing such work can be called upon to put right any inferior work or material, that customer will be far more likely to pay the price and pay it cheerfully than as is the case at present. Here in Toronto there are over 500 licensed men engaged in installing plumbing and heating. What per cent. are capable of giving a satisfactory job? The city authorizes a large per cent. of incompetents to rob the public and also bring discredit upon those capable and who wish to do good work. If all the plumbing and heating which has been installed in Canada within the last ten years were to be put to a rigid test, we venture to say a very small percentage would compare favorably, all because of the slipshod method of licensing any person whether qualified or not, on the one hand and because of there being no way of making the irresponsible licensed men make good any poor work. The very fact of sanitary engineers advocating that a bond be furnished, would prove to the public the sincerity of those engaged in sanitary and heating engineering.



THE TRADE PAPER.

IT is encouraging, to say the least, to receive some of the letters of appreciation which are being sent in by our readers. The other day one of our readers stated that many a single article was more than worth the price of a year's subscription. We hope such at least is the case, because it would be a very little matter which would be worth one dollar. One reader stated not long ago that he would not be without *The Sanitary Engineer* for 10 times the price and said that the tinshop articles had been worth more than \$25 to him.

Now let us state right here that if we are giving our readers a service we feel we are accomplishing something, and the greatest regret we can feel is when our readers cease to send in their troubles. We are here to give ser-

vice. *The Sanitary Engineer* is edited by a practical man who not only overlooks the editorial matter, but also keeps an eye on the advertisements and if an advertiser made rash claims about his products, it would be looked into. The readers of *The Sanitary Engineer* can rely on such goods as are advertised in its pages, and we can assure them that, when buying from our advertisers, they are buying reliable goods from manufacturers who stand back of their products.

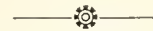
Elbert Hubbard, the well-known American critic, when speaking of trade papers, stated in part:

"The trade paper is probably the most alive to the exigencies of education, and the gratification of the mental needs of its readers, than any other press production. It asks, it absorbs, and it gives.

"Take up a trade paper, note the quality and texture of the paper, the clearness of the type, the beauty of its arrangement, the logic of its arguments, the well-expressed opinions of its contributors. Then, tell me if it isn't an education—beautiful, inspiring and strengthening.

"Thousands of trade paper readers are receiving mental and practical uplift, as well as receiving courage by its means.

"The trade paper is the practical leader of the literary world."



WHEN MONEY IS VALUABLE.

WHAT is money? In the ordinary sense it is a standard of value that can be transferred to discharge an obligation. The value of money and its service is defined by the number of times it is put to use. A dollar which lies in the pocket or in the bank for a month is a dollar at the end of the month. If that same dollar is put into circulation and changes hands say ten times, it has discharged ten debts and on the face of it would seem to represent not one dollar but ten dollars.

Apply this theory to such conditions as are general at the present time. The banks hold on to what money they have; loan companies hold to their assets; individuals follow the example and hang on to what they have—and the first thing we know there is hard times.

If people would consider that every time a dollar changes hands it is worth a dollar, we might get more money into circulation. This is a homely theory of finance but it is one that indicates some of the troubles of to-day.



EDITORIAL COMMENTS.

WATCH FUTURE ISSUES for some of the doings and sayings of the ad-men.

* * *

AND READ, MARK, learn, etc.

* * *

THE PRACTISE in your business some of the rules laid down by the ad-men.

* * *

MAKE TRUTH YOUR corner-stone in both words and action.

* * *

IT'S THE ONLY THING on God's earth that will stand the acid test.

The Canadian Institute of Sanitary Engineers

Showing That the Members of This Institute Are Keeping Pace With the Recommendations Which Were Made at the Recent Convention—The New Roof Terminal Will be in Use by the Time The Sanitary Engineer is in the Hands of Our Readers.

FOLLOWING the epoch-making convention of the Institute of Sanitary Engineers held in May at Edmonton, the city of Winnipeg has not been long in putting the changes recommended into practice, as far as they are able. The principal change has been made in the roof terminal. It has been possible to make this change quickly, as the plumbing inspector has power under the by-law to make any change he deems to the advantage of the community.

The roof cap decided upon at Edmonton has been approved by those concerned, and arrangements are being made for its use right away. Soil pipe terminals will be cut down to the roof, and the Anthes Foundry, Limited, Win-

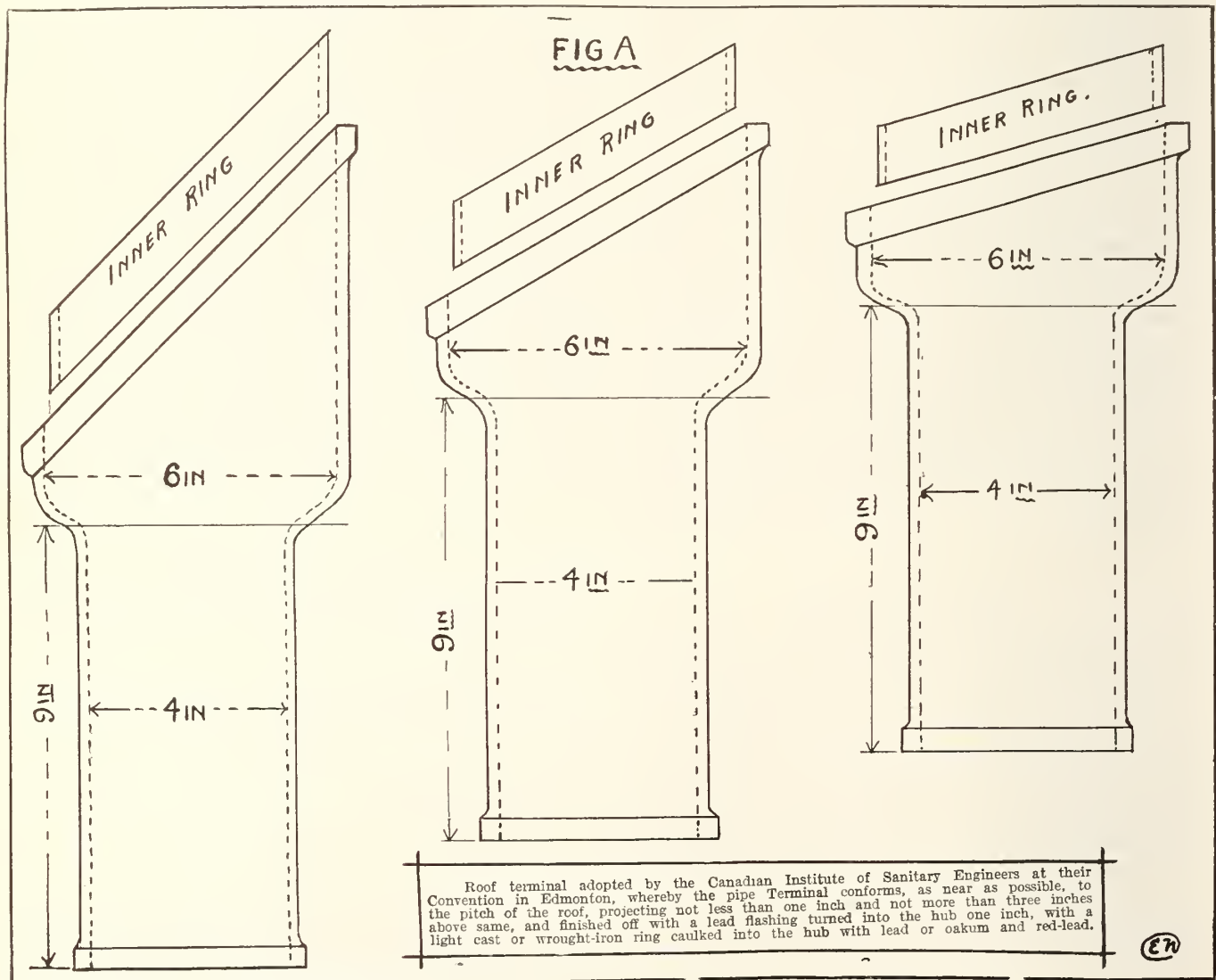
nipeg, are at work making a special bevel fitting for this purpose. The correct bevel had not been decided upon at the time of going to press.

At present the ordinary fittings are being used, but the special fittings will be ready at an early date. Circular letters are being sent by the plumbing department to all sanitary engineers in Winnipeg, informing them of the change which is about to take place. It is said to be meeting with the unanimous approval of the trade.

The other recommendations made at the convention will, of course, take much longer to put into force. The new standardized fittings and pipe, of 4-inch size, will have to be considered by the

various Legislatures before they can come into general use. However, to show how much importance is being attached to these recommendations it is necessary to state that the Anthes Foundry, Limited, Winnipeg, are already preparing to manufacture these new 4-inch pipes, bends, T Ys, the new roof terminals, and deep seal traps.

James Smith, president of the Institute, is confident that in a year's time the three western provinces will have a uniform by-law embodying all the changes recommended at the Edmonton convention. The city of Saskatoon has been considering a new by-law for some time, but delayed it in order to be able to embody the recommendations made by the Institute.



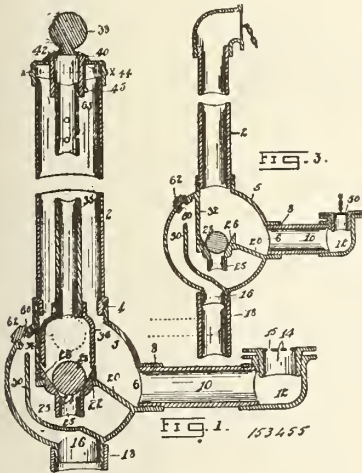
It was proposed that three terminals of different bevels be made as shown.

NEW CANADIAN PATENTS

No. 153,455.

John A. Blichman, Dubuque, Iowa, U.S.A., 3rd February, 1914; 6 years.
Filed 22nd October, 1913. Receipt No. 230,278.

Claim.—1. In a device of the character described, a basin, a bulb, a ball valve in the bulb, a tube connected to the bulb and opening directly upon the top of the ball valve, a waste pipe connected to the bulb and set substantially in the same horizontal plane with the ball valve, and a siphon in the bulb connected to and receiving the waste water from the base of the outlet of the ball valve.



Bath Trap and Overflow.

2. In a device of the character described, an outer tube, a bulb, to which the outer tube is connected, a siphon within the bulb, a ball valve within the bulb, and an inner tube adapted to surround the ball and control the entrance of the water into the ball cavity around the ball.

3. In a device of the character described, a bulb provided with a compartment therein, a ball valve in the compartment, a tube connected to the bulb and opening directly into the compartment upon the top of the ball valve, a waste pipe connected to the bulb and set in substantially the same horizontal plane with the ball valve, and having water communicate directly into the compartment of the ball valve, and a siphon in the bulb connected with the base of the outlet of the ball valve.

4. In a device of the character described, an outer tube, a bulb to which the tube is attached, a siphon within the bulb, a waste pipe leading to the siphon, a ball valve between the waste pipe and siphon, and an inner pipe adapted to be

seated around the ball valve and control the waste water that enters the siphon through the ball valve.

5. In a device of the character described, a bulb, an outer tube connected with the bulb, a siphon within the bulb, a ball valve at the entrance to the siphon, and an inner tube seated around the ball upon the valve seat, said tube provided with openings near the top through which the overflow from the basin is delivered to the siphon through the ball valve.

6. In a device of the character described and in combination with a lavatory or bath tub, a bulb, an outer tube connected with the bulb, a siphon within the bulb, a waste drain pipe connected with the basin, a ball valve between the waste pipe and the siphon and an inner tube provided with openings near its top, and adapted to surround the ball of the valve and rest upon the ball valve seat and control the entrance of the water from the waste pipe into the ball cavity around the ball.

7. In a device of the character described, a bulb, a ball valve in the bulb, a tube connected to the bulb and opening directly above the top of the ball valve, a waste pipe set substantially in the same plane as the ball valve, and having water communicate around the top of the ball valve and down around the valve.

No. 153,463.

George A. Cote, Montreal, Quebec, Canada, 3rd February, 1914; 6 years.
Filed 17th October, 1913. Receipt No. 230,127.

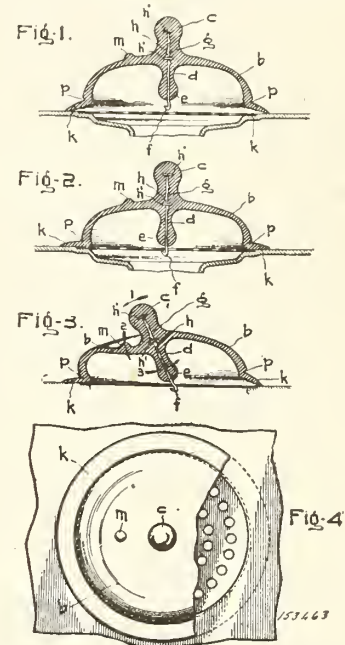
Claim.—1. A sink stopper consisting of an india rubber device of inverted saucer form with an aligned exterior knob and interior boss, the boss extending to a point in close proximity to the plane or level of the rim of the device, and a hook having a shank extending upwardly into the boss and knob, substantially as described.

2. A sink stopper, consisting of an india rubber device of inverted saucer form, having a hook located at the middle of the interior thereof, and the rim of said device being formed with a flat foot, substantially as described.

3. A sink stopper, consisting of an india rubber device of inverted saucer form, having a hook located at the middle of the interior thereof and the body of such device having an exterior

loss indicating the direction in which the hook faces, substantially as described.

4. A sink stopper, consisting of an india rubber device of inverted saucer form, with an aligned exterior knob and interior boss, the boss extending to a point in close proximity to the plane or level of the rim of the device, and a hook having a shank extending upwardly into the boss and knob, and the



. 153,463. Sink Stopper.

rim of the said device being formed with a flat foot, substantially as described.

5. A sink stopper, consisting of an india rubber device of inverted saucer form, with an aligned exterior knob and interior boss, the boss extending to a point in close proximity to the plane or level of the rim of the device, a hook having a shank extending upwardly into the boss and knob, the body of such device having an exterior boss indicating the direction in which the hook faces, and the rim of the said device being formed with a flat foot, substantially as described.

6. A sink stopper, consisting of an india rubber device of inverted saucer form, with an aligned exterior knob and interior boss, the boss extending to a point in close proximity to the plane or level of the rim of the device, and a hook having a shank extending upwardly into the boss and knob, and having a retaining disk rigidly secured for preventing longitudinal displacement of such hook.

(Continued on page 30.)

Poor Work Installed in Public School

A City Architect Passed a Certain Installation, Even Though it Was Not Installed in Accordance with the City By-laws—All Such Work Should be Under the Jurisdiction of the Health Department.

IT has been stated from time to time in **Sanitary Engineer** that none but practical men should be engaged in the construction of such important work as sanitary and heating engineering. We have also stated that such work should be under the jurisdiction of the civic board of health, and not under either the building inspector or architect's department. There is no relation between the work of either and that of the sanitary and heating engineer. Then why should our class of work be in their hands?

We are here citing a case where a certain city has up-to-date plumbing by-laws, but where, in the case of an installation in a public school, the voice of the architect was heard in preference to several practical sanitary engineers. Fig. 1 shows a battery of 18 w.c.'s with no vents, even though the plumbing by-law reads as follows:

Vents from water-closet traps shall be 2 inches for length of 20 feet, and for a greater length 3 inches in diameter.

Closet vents into which other vents are connected shall be 3 inches in diameter. When the vent pipes combine they must be increased in size; and all water-closets must be supplied with a 3-inch local ventilation connected to a flue; but a heated chimney is preferred.

Now, besides there being 18 w.c.'s, none of which are vented, we have two fixtures installed on two upper floors and connected to soil pipe stack in the manner shown. Here is another case where had a practical man been employed such work would not have been installed in

that way. But so long as men of questionable qualifications are allowed to join the craft and to install work of this nature, so long will the public be misled. Simply because an architect says "the work is O.K." is no proof that such is the case. It is not to be expected of him. He has his own work to attend to, and should be satisfied to do his work. However, as long as sanitary engineers knuckle down and allow themselves to be domineered over by the architects and other men who lack experience, just so long will they be the hard worker and never attain the dignity which is their due in the eyes of the public.

This installation was commented upon by various members of the trade, and it was pointed out that the installation was not in accordance with the existing plumbing by-laws, yet because the architect stated it was O.K. there seemed to be nothing more to be done.

There was a case in Toronto where extensive additions were made to a hotel and where bathrooms were placed in the center of the building, away from any outside air. Although the by-law strictly stated that no bathroom should be placed in such a position other than where they were connected directly to the outside, and the architect stated it was a "mere technicality," the Board of Control passed the work.

So, in the face of such evidence, it can be plainly seen that neither building inspectors nor architects should be placed in authority over the work of plumbing, heating or ventilation. It seems a crime that a public school should at this date be equipped with sanitary engineering in

(Continued on Page 32.)

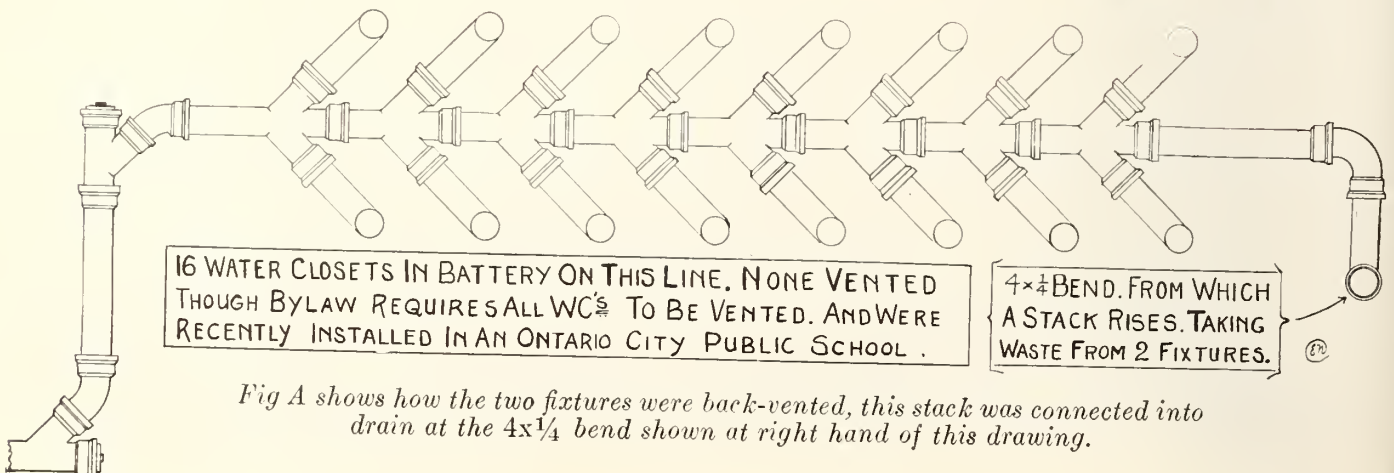
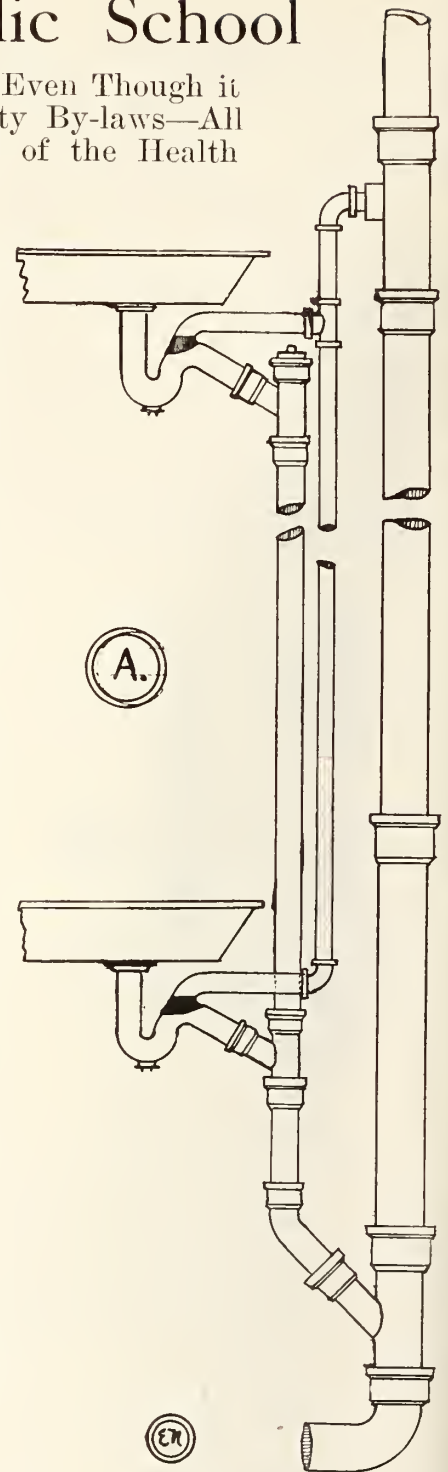


Fig A shows how the two fixtures were back-vented, this stack was connected into drain at the 4x1/4 bend shown at right hand of this drawing.

Only Practical Men Should Hold Licenses

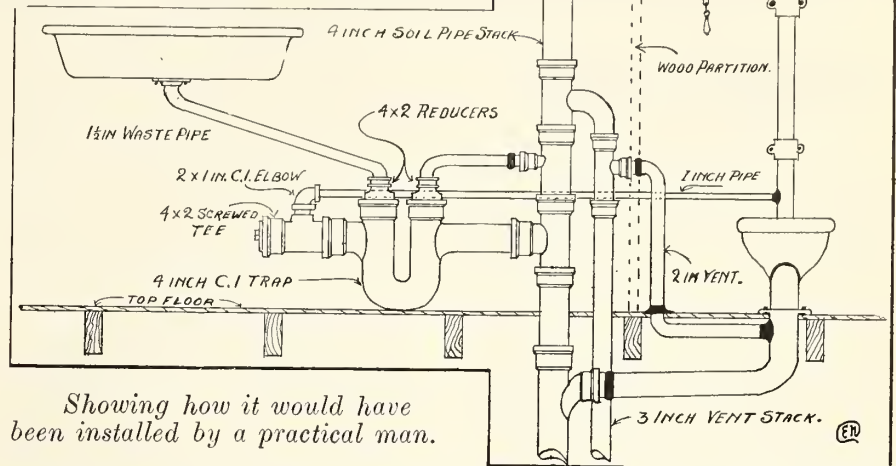
Showing an Example of Work Installed by Men Who Hold Licenses—A Plea for Thorough Examinations in Every City or Town in Canada.

IN a few cities in Canada there are boards of examiners for the purpose of examining persons as to their ability to install sanitary engineering. These boards are generally a part of the board of health, and to some extent are doing good work. But on the other hand, there are more cities and towns which have no such boards, but which for a small sum will grant a license to any applicant without asking any questions as to the qualifications of the applicant. We regret to have to make such a statement. We are going to show why a proper board is necessary to deal with this problem. In the first place, why should a city authorize unqualified men to install the most particular portion of work, such as sanitary and heating engineering in our buildings?

If a man wished to practise medicine he would have to pass severe examinations, and prove that he could be relied upon to give the proper advice in cases of illness; or if a lawyer wished to practise in the legal profession he, too, would require to prove his fitness; but, as we stated before, any person can procure a license to install sanitary and heating engineering for as small a sum as \$1 to \$5. We are reproducing two installations which were seen in one of the largest cities in Canada. The men held licenses authorizing them to do such work.

Now **Sanitary Engineer** maintains that not only should every man who is going to follow the actual installing of sanitary and heating engineering be examined as to his capabilities, but he should also be bonded and pay a yearly license fee as well. Not only this, but he should be called upon to inform the health department of every instance where any work has been done by him which would in any way come under the jurisdiction of the sanitary by-laws of that locality. He should be compelled to affix his name and address, so that if, at a later date, the work could be proved to have been defective, he would have to put it right. By doing this the public would be better served, and sanitation would progress far more rapidly than at present. It may be asked how men could be found out who did such work if it were only repair work. Well, we will take this case shown in Fig. 1. Here we have a building with sanitary conveniences installed, and a portion has been rented to another person, who wishes to have a sink installed. A sani-

tary engineer is called in to do the work. The first step would be to have a by-law in force forbidding any one from having any sanitary appliance installed which would require the opening of any waste,



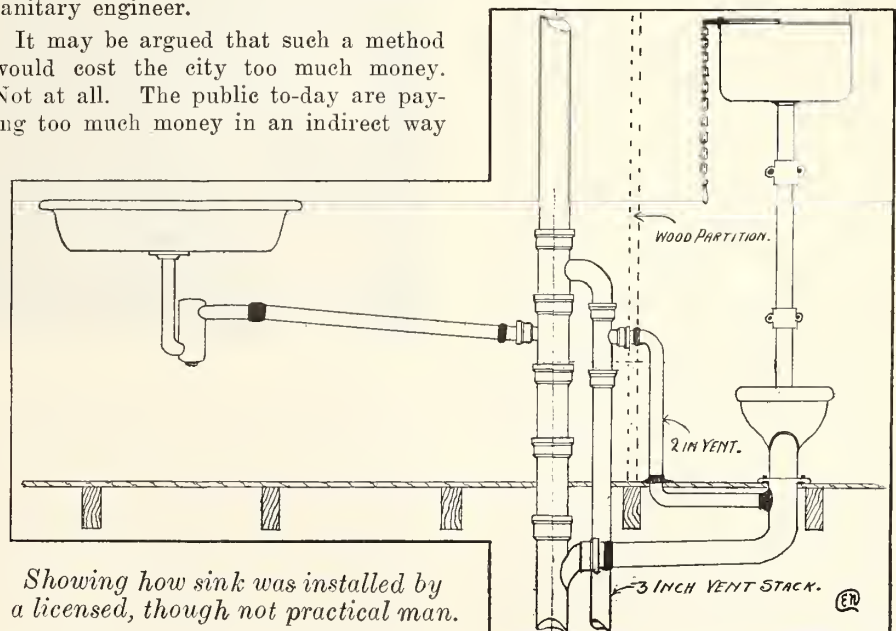
Showing how it would have been installed by a practical man.

procured a permit to do so. Then another by-law would be needed forbidding soil or drain pipe without first having sanitary engineers installing such work unless a permit is produced by the owner. Next step would be an annual inspection of every building in the municipality and a report of what kind of fixtures are installed, and the condition they are in, as well as the name of the sanitary engineer who installed them, and in the event of work being found which was not in accordance with the by-law the inspectors should report and the medical health department take action both with the owner, tenant and sanitary engineer.

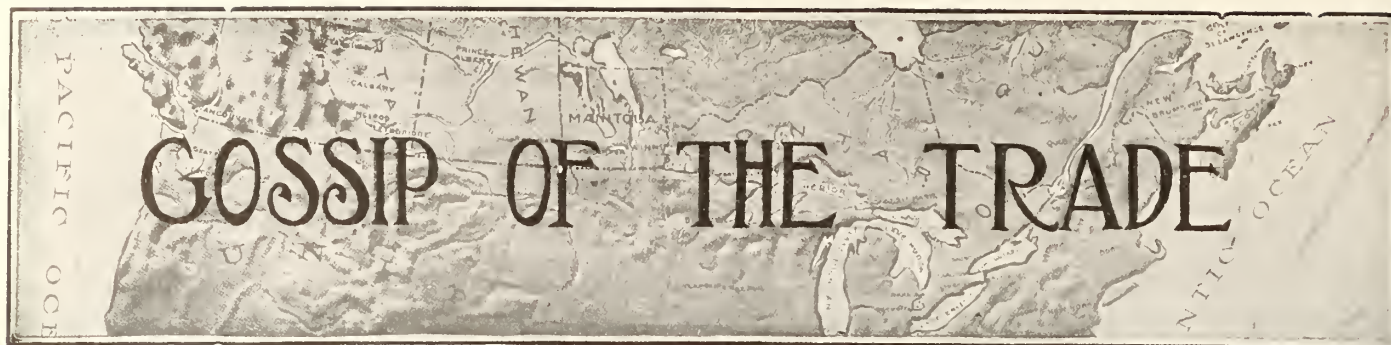
It may be argued that such a method would cost the city too much money. Not at all. The public to-day are paying too much money in an indirect way

than they would under such a system. Such a scheme would force practical men to do the work, and practical inspectors to do the work of inspecting. For instance, if a certain number of practical men were employed by a city, and during the building season these men were kept busy inspecting new work, then in the period when building construction was dull their time could be taken up inspecting houses where repair work might have been done. The results would be bound to bring satisfaction to all concerned.

(Continued on Page 29.)



Showing how sink was installed by a licensed, though not practical man.



FORT WILLIAM RECONSIDERING THE PROBLEM OF EXAMINATIONS FOR PLUMBERS.

After considerable discussion, the Council appointed Aldermen Murphy, Dennis, O'Donnell and the Mayor a committee to reconsider the proposed plumbers' by-law. The journeymen plumbers want to ask that all members of the craft be subjected to an examination, and pay a fee of \$1 a year. They desire that two master plumbers, two journeymen plumbers and the building inspector compose the board of examiners. After a journeyman plumber had told the Council that the masters had agreed to the measure, John Culliton, a master plumber, said he was present when the journeymen passed a resolution to request the Council to pass the by-law, and he gave as a reason for not having voted against it that there were present 25 journeymen and only one master plumber. The Trades and Labor Council had indorsed the measure. It is specified that all master plumbers working themselves with tools, pass an examination, and that all master plumbers pay a yearly fee of \$10 and furnish a bond of \$500.

Aldermen Dean, Byers, Dennis and Hunter were appointed a committee to act with a citizens' committee or any other public body that may be formed to arrange for the first of July celebration. The committee was given power to add to its members.

AFTER KINGSTON CLEAN-UP.

The sanitary inspector, Constable Timmerman, reported that in the annual inspection 5,197 yards and premises were inspected after the cleaning up campaign. There were 301 dirty yards, 36 declared in unhealthy condition, 58 places in which manure was not in covered boxes, 40 cellars with water blocked drains, and 79 houses without sinks.

BUSINESS CHANGED HANDS.

James Fiddis, Lethbridge, has purchased the business of the Southern Plumbing Co., having taken over the interest of his partner, F. E. Cooper.

GOING INTO FARMING.

The Twin City Plumbing and Heating Co., Edmonton, who disbanded last October, and has been run since by W. C. Ochampaugh, will be abandoned altogether during the summer. Mr. Ochampaugh having decided to return east, where he will take up farming, principally devoting his attention to blooded cattle and fruit.

CONVENTION IN WINNIPEG.

From July 16 to 18 the Sanitary Inspectors' Association of Western Canada will be in convention in Winnipeg. It is expected that the attendance will include members from Fort William, Brandon, Portage la Prairie, Saskatoon, Regina, Edmonton, Prince Albert, Lethbridge, Kamloops and other cities in the territory covered by the organization.

OAK BAY, B.C.

A deputation of the Plumbers' Union interviewed the Oak Bay Council recently and urged the appointment of a thoroughly competent inspector and also the insisting on the second, or smoke, test of all completed work. The Council promised to give the question early consideration.

NEW WATER PLANT FOR ORILLIA.

A by-law to raise by debentures \$85,000 for water works purposes was carried by a majority of 66. The vote was small—315 for and 249 against. The money will provide for an entirely new pumping plant, with a mechanical system of filtration, also for laying large mains and extending the service to the southern portion of the town.



The above is a picture taken in the shop of the E. J. Young Plumbing and Sheet Metal Co., Calgary. Seated is A. Desmarchais, who was with the firm four or five years, and during 1913 was manager of the plant. He died about the middle of April. Mr. Desmarchais was secretary-treasurer of the company, an experienced heating engineer, and a member of the American Society of Heating Engineers. The management of the plant has now been assumed by Mr. Young, who was away at the time this picture was taken. Others shown are the office staff and foremen. Frank F. Hatch, foreman of the plumbing department, is the third from the left. J. J. Roberts, foreman in the sheet metal department, is at the extreme left of the picture.

ADDITIONAL SHOW ROOM.

The Standard Ideal Company, Ltd., are opening a new showroom in their Montreal branch, Beaver Hill, for exhibiting kitchen goods. The new room is situated upstairs above the main office and showroom and the kitchen fixtures are set-up as they would appear in actual use. Among the new lines being shown are the "Hercules enamel" sinks and laundry trays. These are finished in black enamel, and a feature of the laundry trays is the cast-in washboard. This does away with the use of a separate washboard.

EASY TO BE PLUMBER.

The draft of a new plumbing by-law was submitted to the Board of Health, Toronto, and given brief consideration. It will be dealt with clause by clause at the next meeting.

Dr. Hastings declared that under the present system any man, however unqualified, could secure a plumber's license and style himself a plumber. "This works against the effective administration of the Health Department, and it is therefore harder to safeguard the health of the people," said Dr. Hastings. He agreed with the suggestion of the plumbers' organization, that all applicants for a license must pass an examination, and he also approved of the general principles of the by-law.

MODERN PLUMBING

The J. L. Mott Iron Works are issuing a beautifully illustrated book entitled Modern Plumbing No. 8. This book should be in the possession of every up-to-date sanitary engineer, and may be procured free by writing to the J. L. Mott Co., Ltd., 134 Bleury street, Montreal.

PLUMBING DEPARTMENT SEPARATE.

The plumbing and sewer departments of the city of Winnipeg have been separated from the department of the city engineer, and Mr. James Smith appointed chief inspector, at a salary of \$200 per month.

Recently, Colonel Ruttan, who has been city engineer of Winnipeg for about thirty years resigned, and W. P. Brereton appointed his successor. The latter thought best interests would be served by confining his work to engineering, whereupon Mr. James Smith, who was at that time chief plumbing inspector, but under the control of the city engineer, took the matter up with

the Board of Control suggesting that plumbing, sewer connection, and sewer maintenance, be made separate. The idea was received favorably, and a by-law drawn up by the city solicitor. This was passed by the city council on June 1.

The plumbing and sewer departments are now located on the second floor of the city hall annex, at the corner of James and King streets. It has been re-furnished throughout, and a separate office provided for Mr. Smith. The staff consists of chief plumbing and sewer inspector, six plumbing inspectors, four sewer inspectors, one draughtsman, a sewer connection leveller, and a rodman. The sewer maintenance department staff consists of a foreman, five sub-foreman, and 25 laborers.

A COMMUNICATION FROM WINNIPEG.

Plumbing & Sewer Department,
223 James Street,
Winnipeg, Man.,

June 25th, 1914.

Dear Sir,—In virtue of powers conferred by Section 39 of By-law 5910, the following method of terminating soil, waste and vent pipes above roofs has been approved and work may be constructed accordingly.—Yours truly,

JAS. SMITH,
Plumbing & Sewer Inspector.

Appendix.

All terminals of soil, waste or ventilating pipes of 4 inches in diameter or less shall be increased 2 inches in diameter before passing through the roof of the premises by means of an increaser with top end conforming as near as possible to pitch of roof and projecting to the outer air not less than 1 inch and not more than 3 inches at any point above the roof, and be made weather-proof by means of a lead flashing. All such lead used for this purpose shall be in weight at least 5 pounds per square foot and shall be worked over and into the hub of increaser with not less than 5 inches of cover on the roof on either side of the pipe terminal, and it shall be finished with a cast or wrought iron ring properly caulked with lead, or oakum and red lead, into the hub thereof.

REPORT NOT YET TO HAND.

The president of the Canadian Institute of Sanitary Engineers would like to notify the members that there will be some delay in getting the printed proceedings of the Edmonton Convention into their hands, as owing to the unscrupulous business methods of the stenographer who was reporting the Conven-

tion, the report was only recently delivered to the secretary and it was found to be very incomplete and a number of original papers in connection with the convention missing. This will necessitate a very complete editing of the report, which will take some time before the matter is ready for the printer.

The stenographer who reported the proceedings has since left Edmonton, leaving no address, and it has been impossible to get any satisfaction.

PROBLEMS IN SHEET METAL WORK.

(Continued from last issue.)

Where arcs meet is point 5 of large end. With point 5 just obtained as a centre and 5 to 6 on Fig. 3 as a radius, strike an arc near 5 on small end; with 5 on small end as a centre and 5 to 6 on small profile as radius, strike an arc cutting one just made. Where arcs meet is point 6 on small end. With point 6 just obtained as a centre and 6 to 6 on Fig. 2 as a radius, strike an arc near point 5 on large end; with point 5 on large end as a centre and 5 to 6 on large profile as a radius, strike an arc cutting one just made. Where arcs meet is point 6 on large end. With point 6 on large end as a centre and 6 to 7, Fig. 3, as a radius, strike an arc near point 6 on small end; with point 6 on small end as a centre and 6 to 7 of small profile as a radius, strike an arc cutting one just made. Where arcs meet is point 7 of small end. With point 7 just obtained as a centre and 7 to 7 on Fig. 2 as a radius, strike an arc near point 6 on large end; with point 6 on large end as a centre and 6 to 7 of large profile as a radius, strike an arc cutting one just made. Where arcs meet is point 7 of large end. Draw line from points 1, 2, 3, 4, 5, 6, 7 on each end and from 7 to 7, and we have one-half the pattern. When laying out pattern, if we work from the centre line both ways, as shown on drawing, we have the pattern of centrepiece complete.

H. W. JOHNS-MANVILLE MOVES TO LARGER PREMISES.

The Duluth office of the H. W. Johns-Manville Co. has moved to larger quarters at No. 327 W. First Street, in order to take care of its increased business. The new office is on the ground floor, with windows for the display of J-M asbestos roofing, pipe coverings, packings, sanitary specialties, auto accessories and other products of this company's well known and varied lines.

Progressive Sanitary Engineers in Edmonton

Showing What the Somerville Hardware Company, Edmonton, Are Doing in Their Sanitary and Heating Department — This Company Supplies Overalls to Each Workman.

IN Western Canada there are plumbing establishments in abundance, but very few plumbing displays. In Edmonton one of the best is that of the Somerville Hardware Co., located on the second floor. The plumbing depart-

ment, as many men only make a guess at the cost.

Novel Installation.

The accompanying cut shows one of their most recent installations.

This interesting plant is situated in

a school building erected here, which has just been finished.

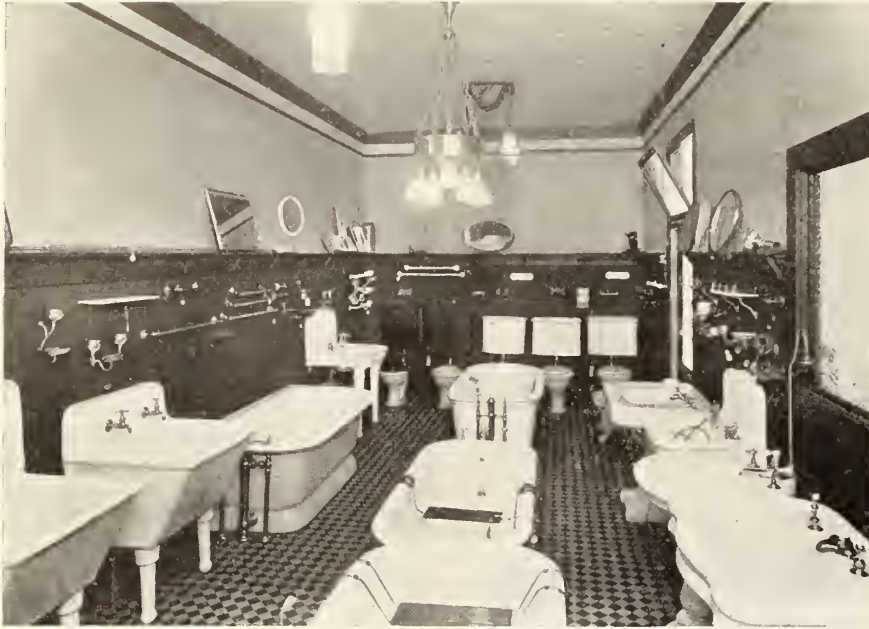
The system is a Monish vacuum system with 2 100-h.p. return fire box boilers and supplying steam at 20 lbs. to low duty vacuum and boiler feed pumps. The exhaust from these help to feed the low pressure mains and is augmented by steam direct from the boilers through pressure reducing valves, the steam being separately reduced by the house mains and vents. The exhaust steam line is, of course, supplied with an oil separator and an oil trap.

The ventilating system provides for a complete change of air in each of 17 class rooms and assembly hall every twelve minutes, the air being tempered, washed and reheated and thermostatically controlled by mixing dampers at entrances to various ducts. Thermostatic control of the Johnson make is also installed in all class rooms on the radiators.

All return mains are under the basement floor, making the job very neat in appearance.

There are two exhaust fans in the roof space for general ventilation and two special exhaust fans, exhausting air through the plumbing fixtures in the boys' and girls' toilets in the basement, which is a very desirable feature.

The system is very complete and the building commissioner of the school
(Continued from page 34.)



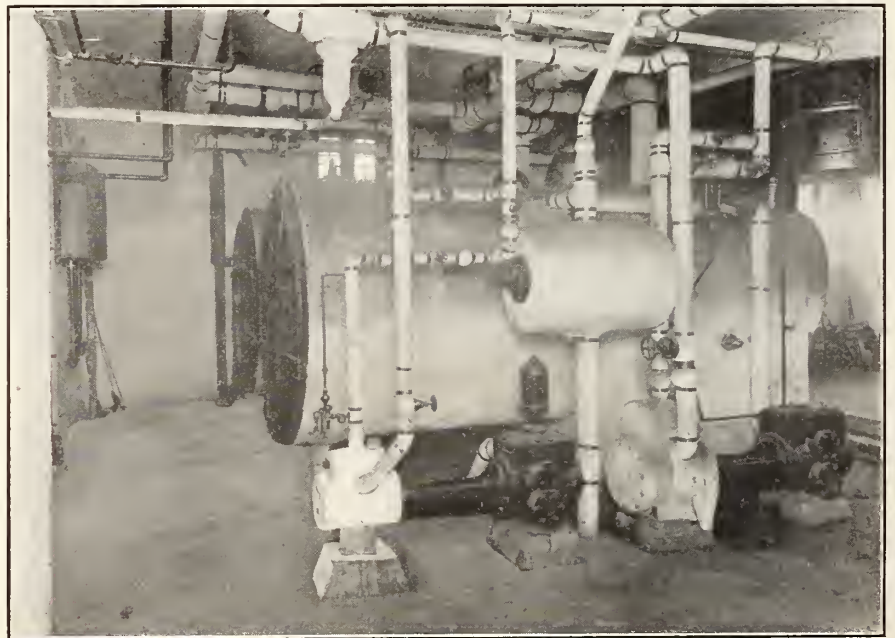
Showroom of plumbing department of Somerville Hardware Co., Edmonton.

ment, the electrical department, and the builders' hardware section, each has a room to itself, and are all connected by doors.

The plumbing section is brilliantly lighted all day long, the electric light showing up the porcelain and nickel parts. It is fitted up like an immense bathroom, with attractive burlap on the walls, and linoleum on the floor. The baths and wash bowls are all connected with mains, so that a customer sees them exactly as they would look in his own home. The plumbing, heating and electric departments are all under one management, and the average weekly payroll is \$600, between 40 and 50 men being employed according to the season.

A cost record is kept of every operation, large or small, and before a sale is passed and sent to the office, it must be initialed by the manager of the department, who sees that the charge for work and supplies is correct. It would pay each shop, says the manager of this department, to take the same care when charging for work done and materials

the King Edward School building in this city, the finest and most up-to-date



Showing steam plant in King Edward School, Edmonton.

Vital Statistics in the Public Health Services

Showing How Misleading the Records on Vital Statistics May be if Not Thoroughly and Practically Compiled, and Should Not be Mere Figures.

By George C. Whipple, Consulting Engineer, New York City, Professor of Sanitary Engineering, Harvard University.

(Continued from last issue.)

And even in the same city similar conditions may be found in different wards, or in different parts of the city, so that it is unfair to compare the death-rate in one ward with that in another ward unless the differences in the constituent individuals are taken into account. We meet this same trouble in comparing rural and urban death-rates. It is the middle aged group, the specific death-rate of which is naturally low, that is migrating towards our cities. This fact alone is tending to reduce our urban death-rates.

Ordinarily we do not go to the trouble of correcting our death-rates to allow for these differences in age and sex and nationality, but it is possible to do this and health officers should study this matter carefully so as to know how to make proper comparisons. The method of computing these "corrected death-rates" may be found in the books previously referred to. By way of illustrating the importance of the corrected death-rate let us consider two cities, A and B, each of which has a population of one thousand, but which differ in the fact that in A there are 100 persons under 10 years of age while in B there are 150 persons under 10 years of age. If the specific death-rate for persons under 10 years of age be taken as 50 and that of persons over 10 years of age be taken as 15 per 1,000 in both cases, then applying these specific death-rates to the number of persons below and above 10 years of age, we find by calculation that in A the general death-rate of the city was 18.5, while in B it was 20.2 per 1,000. This wide difference is due merely to the fact that in B there were 50 more children under 10 years of age than in A out of a total population of 1,000.

We thus see the importance of a more thorough dissection of the data of vital statistics if we are to get the meat out of them.

We might continue our study of the scientific use of the imagination in vital statistics by ascertaining the relation between immigration and the death-rates in manufacturing cities, or by finding the relation between the specific death-rate from tuberculosis and the price of wheat, or the relation between the increase in the use of water gas for illuminating purposes and deaths from gas poisoning.

We might well speculate upon the possible connection between the notable increase in the specific death-rates from circulatory diseases in adults and the intensity of modern city life. For it seems to be a fact which cannot be gainsaid that while the results of sanitary reforms are saving the lives of many people, notably the lives of children, the expectation of life for adults is lessening. In other words, more people to-day live to be 40 or 50 years old than formerly, but of those who do live to be 40 or 50 years old, the chances of living to a ripe old age seems to be gradually lessening. The actuaries of the insurance companies are naturally much concerned over this situation, and it behooves our health departments to consider this question seriously.

Again, in studying morbidity statistics with a view to the early detection of epidemics, there are ample opportunities for the use of the imagination. Perhaps no servant of the public uses his imagination to a greater extent than a well-trained detective. It is precisely this mental attribute that is required in a health officer who is constantly on the watch for impending outbreaks of disease and whose duty it is to ascertain the cause of an outbreak as soon as indications of it appear. Certainly work of this kind cannot be considered as devoid of interest.

We now come to the third phase of our subject, the use of vital statistics with power. By that I mean such a use as will make them effective. It avails little to keep our records and draw our deductions unless we use the results. The man who merely tabulates data and does not study them is a clerk and not a statistician. Statistics, we said before, are numerical statements of facts correlated for study and comparison. The collation means nothing without the critical study. That is the trouble with most health departments to-day. The records are kept by clerks and not by statisticians.

Here Begins the Duty of the Health Officer.

When the health officer has studied his data and drawn his conclusions, his work as a statistician ends, but his most important work remains to be done. If his findings show that an epidemic exists

and that the cause of the epidemic is clear, the important thing is to have the cause removed. For example, if a typhoid fever outbreak is traced to an infected public water supply the important thing is to remove the infection and to take such steps as are necessary to prevent its recurrence. If scarlet fever be traced to a certain dairy the important thing is to prevent the spread of the disease through the milk. To do these things requires the co-operation of other officials, of the engineers, of the police, of the executive officers, and of those who make the laws, and all these must be supported by public opinion. Hence the people must be convinced of the truth of the statistician's findings, and not the least important part of the health officer's work is that of displaying his data and his findings in a clear and attractive way.

Simplicity and Accuracy Essential.

When tables are made they should be as simple as possible. Each column should have a proper heading sufficient to explain what the figures mean. The figures themselves should indicate the accuracy with which the data are collected. It is seldom that statistical records are accurate to more than three or four significant figures. Hence, to accumulate large numbers of significant figures confuse the mind and indicate not accuracy but mental laziness on the part of the statistician. To prepare a good table with a title which clearly explains what the table contains is an art which few health officers ever acquire.

If diagrams are needed to illustrate the statistics, and this is often the case, the diagram should be well drawn, well lettered, and also have a clear title. Care should be taken not to have too many lines or to have these lines overlap in such a way as to be confusing.

The Need for Diagrams.

Diagrams are used for two different purposes. One is for study by the statistician himself and is prepared with the idea of helping him in drawing conclusions. The other type of diagram is prepared for the purpose of illustration after the conclusion has been already obtained. Its especial object is to display the data and visualize the conclusion. Such a diagram should be drawn

according to the artistic laws that apply to a cartoon, an important one being that it must instantly convey its meaning to him who sees it. There are various ways in which diagrams are prepared for the purpose of presenting statistical facts, and a few of these will be illustrated by diagram shown upon the screen.

Things to Be Avoided.

In the use of vital statistics certain things must be avoided by public health officers. One of these is a too hasty publication of conclusions. In a matter where so many factors may be involved, it is easy to be wrong and errors may have serious consequences. If the cause of an epidemic is wrongly located valuable time may be lost and much money may be wasted in doing things that do not need to be done while the epidemic goes on unchecked. An outbreak of typhoid fever wrongfully attributed to milk may injure a milkman's business and reputation for life. The oyster business has been seriously injured by injudicious statements on the part of the public health authorities, and the same is true of the ice business. Facts need not be withheld from publication, but in drawing conclusions judgment should be suspended until the statistician is perfectly sure of his ground.

Another thing that should be avoided is that of making unusual and extreme comparisons for the sake of attracting attention. The attempt of some health departments to use popular bulletins is both pathetic and amusing. By way of illustration of these undesirable comparisons may be mentioned the story that has been recently going the rounds of the magazines. A man said to his friend, "I have been studying statistics and have been appalled at the number of deaths that are occurring the world. Why, just think! Every time I breathe somebody dies." His friend replied, "Why don't you chew cloves?"

Knowledge is Power.

We come now to a recital of some of the practical benefits of what may be called "applied demography" in the service of the health department. It is not necessary to enlarge on the use of morbidity records in the forecasting of disease and their use in the practical control of epidemics, but it should not be forgotten that there is a reciprocal effect of this work. One of the most important results is the education of the health officer himself. One cannot carefully and persistently study the vital statistics of a city without becoming a more efficient public servant. Knowledge is power here as everywhere. Knowledge of the plague spots is prerequisite to their eradication. This knowledge is at best acquired slowly, especially if the

one has not been trained in the use of statistics. The need of long tenure in office is thus seen. It is to be hoped that it is not far distant when all health executives will be technically trained men—men who have received, at least, a diploma in public health.

Vital statistics also educate the public as to the health conditions in their cities. Dr. Rankin has said that most sick towns do not know that they are sick. He once made the experiment of asking the physicians and city officials of a southern city as to their opinion of the health of the city. The consensus of these opinions was that the place was a healthy one, yet the vital statistics showed it to have almost the highest death-rate of any city in the state.

The general death-rates and certain specific death-rates should be published in the local papers with as much regularity as the records of the weather bureau—not as headlines to appear only when there is an epidemic of some disease, but in such a way that the reader would come to look at these rates as a matter of course, and notice whether the figures were high or low. At present who knows what is high or what is low for the general death-rate of the city in which he lives?

We have come to regard 70° as summer temperature, and we regard 0° as very cold. We have come to regard a body temperature 99° or 100° as a condition of fever, but who knows whether a death-rate of fifteen or twenty per thousand is indicative of satisfactory hygienic conditions in his city or not. In this matter the public will have to be educated with patience. Nevertheless the attempt should be made.

Low Death-rate a Civic Pride.

In time the public will come to regard a low death-rate with justifiable civic pride, and a high death-rate not as a visitation of Providence, but as an indication that something is wrong that needs to be corrected. Vital statistics, therefore, will serve as a sort of measure of the efficiency of the health department service.

Dispense With Unnecessary Habits.

The comparative study of specific rates for different diseases should serve also as a basis for adjusting the expenditures of the health department. At present our public health budgets are illogically prepared. We do many needless things, Dr. Chapin says, because we have always done them. Some of our habits were acquired before the days of bacteriology and preventive medicine, and it is hard to break loose from them. It is time that greater discrimination was used and the public money spent where it will do the most good. Logically the greatest energy should be turned to those diseases that do the most damage,

and to those activities where definite benefits have been known to result.

For example, we note as a matter of experience that contaminated water causes typhoid fever, and we note that the purification of such water reduces the typhoid fever death-rate. It is logical, therefore, to spend money for water purification. We do not, however, know that the treatment or purification of sewage insures a like result. Expenditures in this direction are of questionable advisability so far as life-saving is concerned, although expenditures for sewage treatment may be justified for other reasons. While we talk much about typhoid fever and spend large sums of money for its prevention, and properly so, we fail to remember that there are other diseases far more destructive of life than typhoid fever, and that some of these do not receive anywhere near the attention that they deserve.

Statistics indicate that various economic and social conditions have an important bearing upon the health of the community.

The increasing debts of our cities, towns, corporations, and we may add the debts of individuals as well, are likely to have a very material effect on the public health. The last special report of the United States Bureau of the census on financial statistics of cities of over thirty thousand inhabitants show that during the last eight years the annual revenue receipts in 145 cities had increased on an average from \$20 to \$27 per capita, a gain of 35 per cent. In New York city the budget appropriations increased from \$27 in 1900 to \$34 in 1910. The report also shows that in many cities, and especially in larger ones, the bonded indebtedness is increasing alarmingly. As long as the cities continue to grow and assessed valuations continue to increase the danger ahead is not so easily discerned. But what will happen when our cities cease to grow at their present rate, and when the interest on the debts incurred begin to bear more heavily on the taxpayer? There is certainly grave danger that our reckless spending may bring a terrible retribution all along the line, from the man who mortgages his house to buy an automobile, to the nation that squanders its millions on battleships and standing armies.

Study Matters From Various Standpoints.

Nowhere else is more discrimination needed perhaps than in the efforts made to improve the quality of our food supplies. Here exaggeration is in danger of running riot. Ice is said to transmit disease. Perhaps it can, but it almost never does. Polluted oysters are said to

transmit typhoid fever. Doubtless they can, but they very seldom do. There is need of studying all these matters from the quantitative as well as the qualitative standpoint. So also the egg questions, the milk question and the use of preservatives, and the effect of cold storage as to the magnitude of possible dangers, and the element of cost cannot be ignored even by sanitarians and hygienists. Pure food means more expensive food, and if the requirements are stricter than they need be, it means useless expense. If in our enthusiasm for the saving of life and the protection of health we pile up debt, we must remember that in the long run debt means poverty and poverty means deprivation and disease, so that in the end we may fail to accomplish that for which we strive.

Must Count the Vital Cost.

In the field of public hygiene and sanitation as well as in all other departments of public service there is need of careful discrimination. There is danger lest zeal for the public health service in certain directions be carried too far. Some sanitarians have said that no expense can be too great if a human life is saved. This is not true if the cost is paid at the expense of generations to come, and if the same amount of money spent for saving one life could have been made to save many more lives if spent in a different manner. We all rejoice in the reduction of the death-rates of our cities, but we are coming to realize that, as Professor Jordan has said, there are fruitless as well as fruitful lines of endeavor in the public health service. These matters must be sifted out by a careful study of vital statistics.

We see, therefore, that no health officer is worthy of the name if he does not know how to deal with statistics and how to use them with truth, with imagination, and with power.

ONLY PRACTICAL MEN SHOULD HOLD LICENSES.

(Continued from page 23.)

In Fig. 1 we show a w.c. on the top floor of a building. The w.c. is vented, as are all other fixtures below it. A room to one side is rented to a person who requires a sink installed, and the sink is installed in the manner shown; viz., the soil pipe stack is broken open and a 4-in. east iron soil pipe tee is inserted. Then a 4-in. C-1 trap is connected up, as shown. Then at one end of the trap a 4 x 2 C-1 soil pipe tee and clean-out is caulked in, and from the 2-in.

branch a one-inch piece of iron pipe is connected to the flush pipe of the w.c. Now, it is quite apparent that no practical man would ever have installed a sink or any other fixture in such a way; and, further, had an inspector called in to see the work, it would have been ordered to be changed. The reason it was found out was that the tenant who had the w.c. complained that it would not flush properly.

In Fig. 2 we show how this work should, and would in all probability, have been done had a practical man been called in. This man must have had an extra commission on all the fittings he could use. In conclusion, let us state that every member of the craft should be up and doing all in his power to bring about the examination of sanitary engineers, the placing of a practical man on the boards of health. Advocate a bond being required of all applicants for licenses to install such important work, so that failing to observe all the by-laws governing the work the authorities could hold the offender liable.

CONSERVATION OF HEAT UNIT.

How many heating engineers take the trouble to figure on the loss of heat units which takes place in a cellar or basement where the furnace and mains are not protected by a good pipe covering. Many instances can be cited where a heating system has proved inadequate to heat the building or residence so as to give any degree of comfort.

Just recently a case came to the writer's notice where no covering was called for in the specifications and when the fire was put on there was poor results. The owner got annoyed and was told the furnace was N.G., and a score other faults which were nothing but imaginary. However the owner at last called in the architect and pointed out that the system was not giving satisfaction which resulted in the architect asking the heating engineer what he would advise, and he stated the whole installation should be covered.

He pointed out where that while he was aware it would have been better to have had a size larger furnace, that on account of the construction of the cellar, it was rather colder than the average. Further it was pointed out that the mains all ran very close to the windows, thus causing a loss of heat units before the heat reached the radiators.

However both the owner and architect demurred somewhat at the claims the heating engineer

made when he stated it should be well covered, but in the end they both gave way to him, and a first-class job with every satisfaction was the result. Another instance, view of which we herewith produce, is that of the city of Middleton, Ohio, where Mr. John Lloyd, the progressive director of Public Safety, found that the city's water works could make a big saving by a complete revolution in the method of covered steam pipes throughout the big plant.

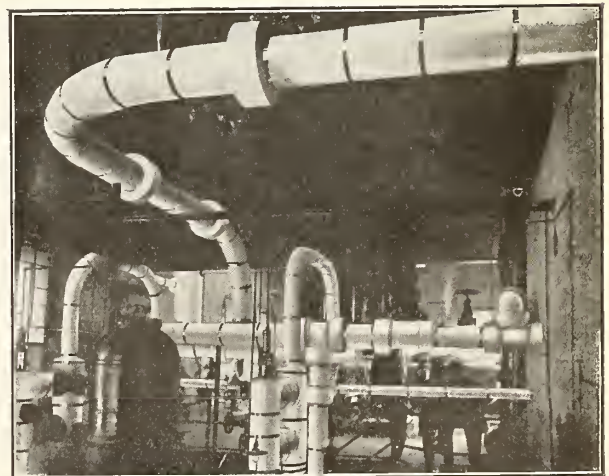
He therefore took the matter up and had every length of steam mains covered, with the result that condensation was reduced to the extent of 76 lbs. per hour.

The trade as a whole do not appreciate the good results which can be derived from covering all mains, returns and boiler. Whether hot water or steam.

Professor C. L. Norton of the Massachusetts Institute of Technology, showed in recent tests taken, that it cost approximately \$225 per year to maintain 100 lbs. pressure on 100 square feet of pipe surface. Finally we may state if there is any portion of a heating system which will give the most satisfaction with compound interest, it is the covering of the installation.

LOSING TRADE.

The writer saw a clerk deliberately smoking a pipe the other day in a country store as he waited on a prosperous-looking farmer's wife. He frequently paused to light a match as he talked to her and smeared tobacco ashes all over some enamelware that she was looking at. They appeared to be old friends and on the best of terms, but friendship is one thing and business another. It may be that the woman had no idea of buying in the first place; at any rate she went out empty-handed, only to come out of the rival's store in a few minutes with an armful of enamelware.



Toronto Society Annual Picnic

The Toronto Society of Domestic Sanitary and Heating Engineers Will Hold Their Annual Picnic on Tuesday, July 14, 1914—Splendid Program Has Been Arranged.

The above society have arranged to hold their Annual Picnic this year at Island Park, Toronto, on Tuesday, July 14th. The boat will leave the wharf at 1 P.M. All members of the trade are invited to attend, bringing with them their wives, children and sweet-hearts. The representatives of the manufacturers, jobbers and suppliers are also invited to join in the occasion; also bring their wives, children and sweet-hearts (if any).

One of the star events will be a baseball match between the Sanitary Engineers and Suppliers. No. 1 Diamond has been secured.

There will be races for all classes, and splendid prizes are to be given to the winners.

At the close of the games there will be a splendid dinner served in the pavilion.

Tickets, which will include boat fares, dinner and all other entertainments, can be procured from the following members of the Picnic Committee:

H. Waterman, Chairman; N. Swanston, Secretary; Also from Messrs. Maxwell, Hillier, Passmore, Daniels, Farthing, Boddington, Gentle, Smyth, Jno. E. Fullerton.

It is to be hoped that every member will make arrangements to be present; that every member of the supply houses will also be on hand, all with a view of making this event the most successful ever had.

NEW CANADIAN PATENTS.

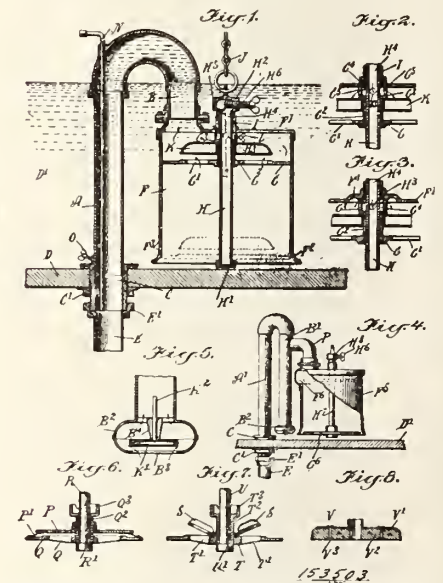
(Continued from page 21.)

The Hinsdale Company, assignee of Winfield Eugene Hinsdale, both of New York City, New York, U.S.A., 3rd February, 1914; 6 years. Filed 19th September, 1913. Receipt No. 229,095.

Claim.—1. A water closet bowl support embracing a floor plate, a supporting plate located at an angle thereto and having an opening therethrough of greater diameter than the outlet pipe of the closet, means for attaching the closet to said supporting plate, together with means for adjusting the horizontal level of the bowl, substantially as described.

2. A water closet bowl, substantially as described, vertically adjustable supporting plate having an opening there-through for receiving the outlet pipe of the bowl, in combination with means for adjusting the horizontal level of the bowl, substantially as described.

3. A water closet bowl support embracing a floor plate provided at its inner edge with two bosses, in combination with a vertically disposed supporting



Siphon Valve for Flushing Tanks.

plate having an opening for receiving the outlet pipe of the bowl, together with adjusting means for effecting the horizontal level of the bowl with relation to the floor, substantially as described.

4. A water closet bowl support of bracket form, one part of the bracket being adapted to be secured beneath the floor line and the other part thereto to be secured behind the wall line, together with vertically arranged supporting parts provided with means for adjusting the bowl to various heights, in combination with means for adjusting it horizontally, substantially as described.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

GREASE TROUBLES SEPTIC TANK. Editor Sanitary Engineer:

I have read with considerable interest the articles in your paper on "Septic Tanks."

We have a septic tank here which works fairly well, except that periodically we have to remove an accumulation of grease, etc. I may also state that there is a grease trap installed on the waste of the kitchen sink, but in spite of this trap being cleaned out fairly often, grease finds its way into the septic tank.

Can you advise any chemical that could be put into the tank to assist in decomposing the solid matter, which we have had to clean out several times.

H. J., B.C.

Replying to H. J., we may state that we cannot understand the trouble he is having on account of the accumulation of grease. If the septic tank is doing its work there should be no such trouble, and before we could really tell him what is the cause we would require to be furnished with a few particulars first, the design of tank, the size, the number of persons residing in the house. Referring to the grease trap, unless an extraordinary large amount of grease is made, there should not be any need for a grease trap, as grease is really a splendid generator of bacteria, which is the life of the septic tank principle. The writer had several such jobs to investigate and found that the occupants of the house were in the habit of using every kind of soap for every purpose which was highly charged with such disinfectants as carbolic, coal tar soap, etc., with the result that these chemicals were actually killing the bacteria which was required to break up the solids. Therefore it must be stated here that great care should be taken that no kind of disinfectant should

be used where a septic tank is used. The writer had a case one time where the lady of the house would persist in using every kind of disinfectant, and lots of them, which resulted in the whole ground area having to be dug up and new earth put into the trenches, and in spite of advice given by the writer this lady had to consult a bacteriologist before she could be convinced. If H. J. will let us have more particulars, we will be only too pleased to take the case up and show him where and how his trouble is caused. —Editor.



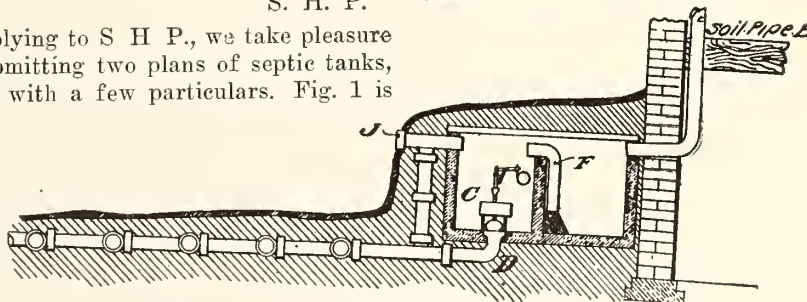
A MODERN SEPTIC TANK FOR DWELLING HOUSE.

Editor Sanitary Engineer:

Will you be good enough to give a sketch of what you would consider a modern and sanitary septic tank for use in connection with dwelling houses, and any other information regarding septic tanks will be thankfully received.

S. H. P.

Replying to S. H. P., we take pleasure in submitting two plans of septic tanks, along with a few particulars. Fig. 1 is



Septic tank with pipes in position.

that of a modern septic tank with the use of a Quinn valve, and which works very positively. The method in which the valve works is exactly in the same way as the flush tank of a w.c. When the dosing chamber becomes full the copper ball rises and releases a cam which holds the float down. Then on this float becoming released, it automatically re-

leases a large valve which is fitted with a specially prepared feather-edged washer. Then when the tank is empty the float lowers, at the same time bringing the washer into contact with the seat, and the ball then lowers, at the same time locking the large float tight down. These are well known in all parts of Canada and require no attention once they are properly installed. Fig. 2 shows a tank which is fitted with a syphon, which speaks for itself. Syphonic action is set up in the usual way and the small pipe is fitted into the syphon so as to break up syphonic action the moment the tank is empty, thus preventing the trap becoming fouled by syphonic action. It really is what might be called a vent for the syphon. Whichever type of tank is adopted, the same system of tile pipe should be used and laid as shown in Fig. 3. These should not be any lower than 12 to 14 inches at the outside, 12 inches being about right. The fall to allow should not be more than 1 inch in 10 or 15 feet, as if there

is too much fall the sewage will run to the lower reaches and possibly leave the pipes near the tank with little or no fluid in them, and also there is a danger of overloading the pipes at the farthest point.

The size of a tank should be large enough to flush every 24 hours and not oftener, because the excreta would not

be in a proper condition before that time.

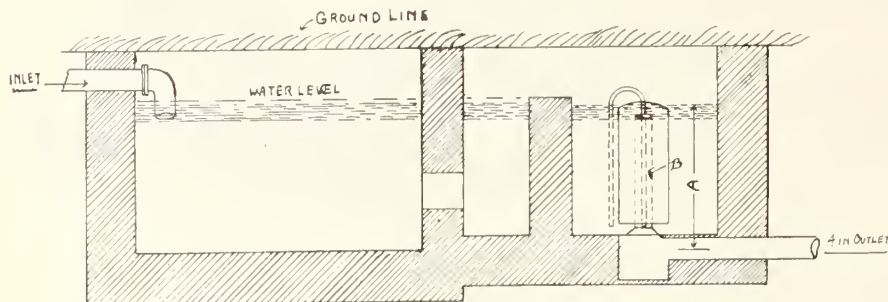
In figuring out the size of tank necessary, the following may be taken as a safe rule, viz:— For every occupant of a private house or hotel, allow 3 cu. ft. of space in each compartment while for a school or factory, where, as in the

even though they are only 12 or 14 inches below the surface, and in other portions the ground is known to freeze solid to the extent of 5 to 6 or 7 feet, is because of the activity of the germs which are working continuously; that there is also a warmth caused by the fertilizing chemical properties which will

POOR INSTALLATION IN PUBLIC SCHOOL.

(Continued from page 22.)

such a way, and particularly when practical men are available who know better. Such work is and always will be of important enough a nature to be made the engineering department of the boards



Mearn Syphon Valve.—Fig 2.

case of a house, nothing but domestic sewage is to be treated, one-third less space will be sufficient, and for every cubic foot in one compartment allow 13 feet of 4-inch field tile pipe.

The reason that only 13 feet of tile pipe is required to every cubic area of one tank is necessary, is because the contents of one tank only is flushed at one time into the tile.

not freeze when in favorable contact with mother earth. Now it may sound strange, but if these tile pipes were laid say two feet below the surface they would be more apt to freeze than at one foot, because the bacteria which acts upon the excreta require to breathe and are called aerobes, or shall we say, bacteria germs which require air, whilst the germs which work in the septic tank are

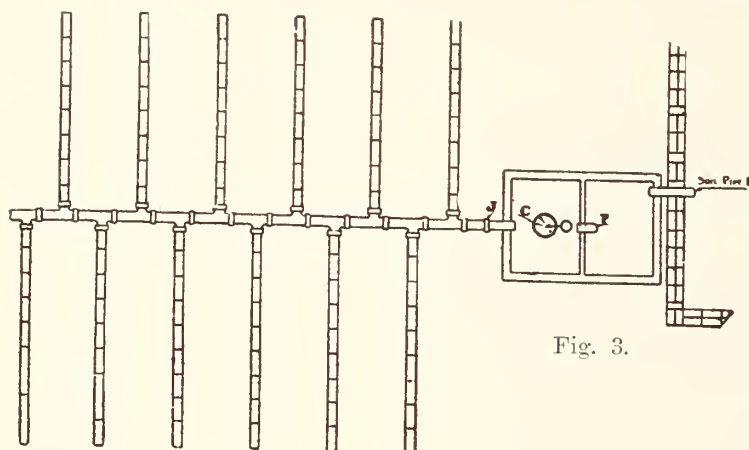


Fig. 3.

WHY DOES THE SEWAGE NOT FREEZE?

Editor Sanitary Engineer:

I have been greatly interested in several articles you have recently published re reptie tanks for sewage disposal. Although you claim that this system is perfectly satisfactory where the frost penetrates the ground to a depth of 6 ft., I am not quite convinced, and would be very pleased if you would publish an article explaining why the sewage will not freeze this system when the tile pipes are laid so near to the surface of the earth.

Enquirer C. W. H.

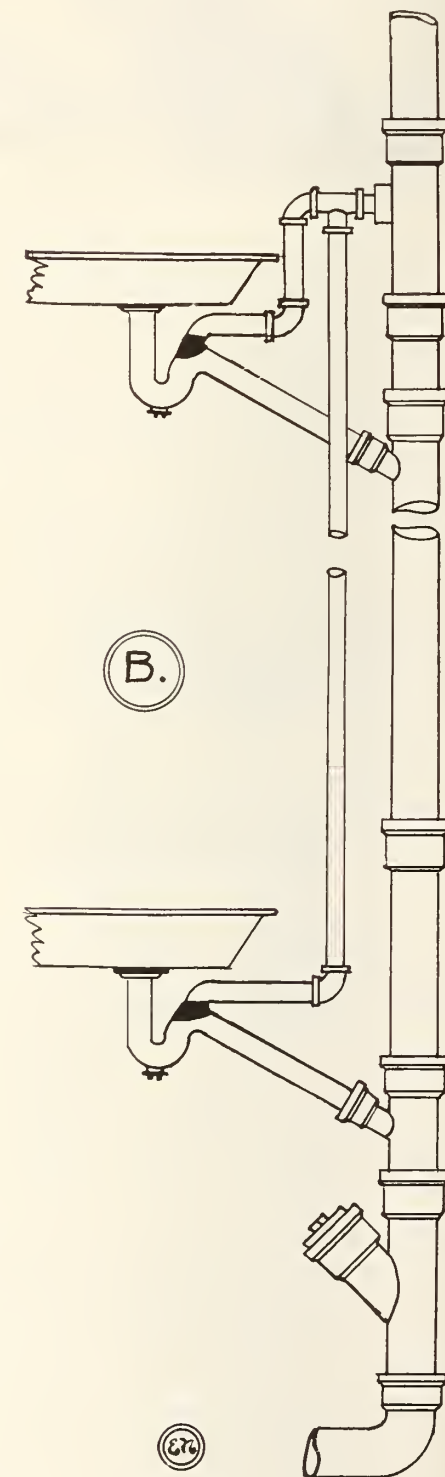
Replying to Enquirer C. W. H., we may state that the reason the ground does not freeze where the tiles are laid

called anerobes, and do not require air. They break up the solids and form soluble salts and when the sludge and salts are let into the dosing chamber, then flushed into the irrigation tiles, the work of the aerobes begin. While speaking of this subject of septic tanks we would like our readers to send in problems of this nature and we will endeavor to give them some assistance.—Editor.



DON'T WORRY.

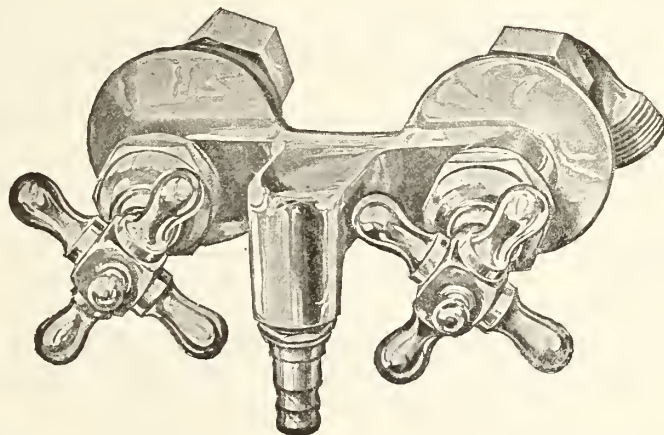
If you've got anything on your mind that is a source of worry to you forget it, and start counting sheep jumping over a fence. Then get jumping after pleasanter things yourself.



of health. It is a class of work which is so closely allied to the health of humanity, and is, therefore, necessarily a part of the board of health, whose jurisdiction only should it be under.



EMPIRE No. 2 MIDGET BATH-COCK



Look at it well ; isn't it just what you have been waiting for?

A compact and well-designed compression bath cock.

The best of metal is used in its manufacture and the utmost care taken that all threads are made to standards.

Its design has beauty in every line and the nickel finish is perfection itself.

If your jobber does not stock it write us at once, you cannot afford to be without it.

EMPIRE MANUFACTURING CO., LIMITED

LONDON, CANADA

MANUFACTURERS OF AND DEALERS IN
PLUMBERS' AND STEAMFITTERS' SUPPLIES OF ALL KINDS

Plumbing and Heating Markets

Montreal, June 27.—Business is fairly good and it is stated that June is about even with last year. The month of May was a little ahead of the same month a year ago, according to the supply houses. While there is still some talk of tight money and dull times the general tendency seems to be to look hopefully to the future and several of the manufacturers and jobbers predict a boom for fall. There is a lot of work in hand in architects' offices and estimates are being asked for many contracts. It is stated, however, that work is slow in closing up just now and it is likely to come with a rush later on. A good deal of building work is under way in the business section, such as the Imperial Bank building, the National Trust building and a number of other big structures that have been in course of construction for some time, as well as two big theaters and a lot of remodeling of buildings uptown. A considerable amount of residential building is going on, particularly in the north and east ends of the city. It was announced this week also that the Canadian Northern Railway would commence the erection immediately of a temporary terminal on Lagauchetiere street, at a cost of about \$250,000. The temporary structure is made necessary owing to the rapid advance of their tunnel through Mount Royal, for which they are preparing to take care of traffic in May, 1915, and the big two million dollar terminal could not be completed until at least two years.

Metal Markets.

There has been some fluctuation in several of the markets but the general situation is weak. Demand has been quiet and though prices are as low as they are likely to go, there does not seem to be any disposition to buy extensively. Probably this lack of orders is one of the factors in keeping the market down. Tin, lead and sheet zinc have all declined recently.

Lead and Lead Waste Pipe.

There has been an average demand for lead and lead waste pipe, but prices have not changed, and the discounts remain the same. A fair business is reported in solder, with quotations unchanged.

Soil Pipe and Fittings.

There has not been as much demand as at this time a year ago, and orders are being filled promptly by manufacturers, as in many cases the mills are pretty well stocked.

Black and Galvanized Iron Pipe.

The market is unchanged under a fairly active demand. Orders are being taken care of by the makers without delay, and stocks in the hands of jobbers are ample to fill all present require-

ments. Pipe fittings are in about the same position.

Brass Goods.

Quotations on brass goods are unchanged, and the demand has been about the average. An improvement is looked for in the near future, as work now in hand develops.

Enamelware

While sales have not been as heavy as expected, the month of June has about broken even with a year ago. It is apparent that a better class of goods is being put in, as sales of higher-priced lines show a steady increase. Few of the shops carry a stock of enamelware, and this sometimes makes it difficult for manufacturers to fill orders as promptly as they would like to, especially if the demand is for some one type of fixture, rather than a variety. There has been quite a movement of combination sink and laundry trays for apartment houses.

Collections.

Some improvement is noted in collections, and complaints on this score are not as frequent as they were a while ago.

Toronto, June 29.—Business in and around Toronto seems to be poorly divided. Some shops report business better than ever before for the month of June, while others are not as busy by a long way as they have been in previous years. There is not the amount of large buildings going up as in years past, and shops, whose men were busy on large contracts, are taking up a lot of residential work.

If, however, all the buildings are put up for which permits are already granted, no doubt business will prove better than was even expected by the most optimistic.

There is, however, a reason why some shops are not busy, and that is they find they must stick out for their price, as there is such a small margin on work which is for residents, considering the amount of attention required and the area which one's men cover.

Enamelware.

There is if anything a slight improvement in this line. Sanitary engineers have been reducing their stocks somewhat, and are now buying a little, though there is not the feeling that big stocks will be the order of the day, but rather smaller-sized orders and more in number; there has been a revision in prices recently.

Brass Goods.

This line is about the same. Manufacturers report a slight improvement. Higher grade goods are finding a readier market in comparison with the quantities of goods being sold. Prices remain the same, though manufacturers are pay-

ing more attention just now to the quality of their goods than to the lowering of prices.

Lead and Lead Pipe and Traps.

There is no great rush on this line; just a steady demand, and prices remain unchanged since last time of writing.

Zinc (Sheet) and Ingot.

This metal is declining somewhat on account of slow demands, and in spite of the fact there does not seem to be any indications of brisker buying.

Tin.

Tin is also a little lower in price, which follows that solder also has dropped a little. Yet buyers do not seem to be inclined to take advantage, even though as building operations become more advanced, there will be a heavier demand, and prices no doubt will take up a healthier tone.

Soil Pipe and Fittings.

This line is looking up a little, but there is no fears of a shortage, as manufacturers got an earlier start this year, and the stocks are in better shape to cope with any immediate demands that may be made. Prices remain the same.

Black and Galvanized Pipe and Fittings.

Demands are a little better than was the case a few weeks ago, and as yet there is no changes in prices.

Collections.

There seems to be a general feeling that collections are on the whole not too bad. There is, if anything, a slight improvement. This is accounted for by the fact that buyers are handling smaller orders on shorter terms.



SOMERVILLE DISPLAY.

(Continued from page 26.)

board, Mr. Geo. E. Turner, is much pleased with it.

The contracting price of this installation was slightly under forty thousand dollars (\$40,000). The amount of direct radiation installed was approximately six thousand, five hundred feet (6,500 feet) and the capacity of the air handling apparatus is about twenty-five thousand (25,000 feet) per minute.

The Sommerville Hardware Co. encourages its men to be on the lookout for new business. They are expected to watch building reports, and to report if they see a hole in the ground, or a building in course of erection.

Each workman carries a small red silk flag on the bib of his overalls; thus each is an advertiser for the firm. The men are supplied with overalls that fit them, and this silk flag is sewn on at the factory where they are made. When a man leaves the company's employ, he is expected to return the overalls. By placing confidence in their men, the company hears of a lot of work that would otherwise pass unnoticed.

No Leader Screws and Nuts in the Premier Die Stock

—and it threads 1 to 2 inch right and 1 to 2 inch left with one set of dies.

It starts itself on the pipe, also throws itself out after a "Briggs" Standard Thread is cut instead of backing off, which spoils the dies.

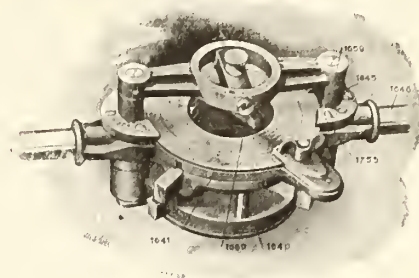
The new patent Off-Set Die, which can be used only in the "Premier," has overcome the difficulties that go hand in hand with leader screws and nuts—and is made in such a way that once over the pipe it accomplishes what any other make of die would in going over twice. One set of teeth is much lower than the other, consequently every tooth does an equal amount of work.

No loose bushings to carry around or lose.

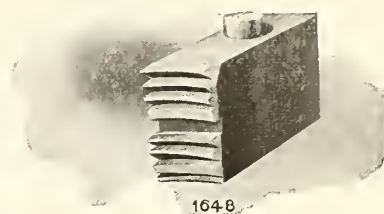
The "Premier" has but one lock, and that is used only when changing from one size to another. The centering device has a scroll cam, without locks, which operates the three jaws that guide the die stock on pipe.

A novice can easily operate the Premier efficiently.

Write for price and full particulars.



Die Stock Open



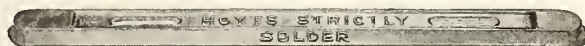
Two Dies in One

Borden-Canadian Company

66 Richmond Street East,

TORONTO, ONT.

Our Mixed Metal Sales Amount to Over \$5,000,000 Annually



THE RESULT OF QUALITY

Babbitt Metal, Bar Solder, Wiping Solder, Wire Solder, Lead Pipe, Bar Lead, Traps, Bends, Copper, Tin and Antimony.

Let the goods prove their worthiness of a place in your stock. Send a trial order.

Hoyt Metal Co.,

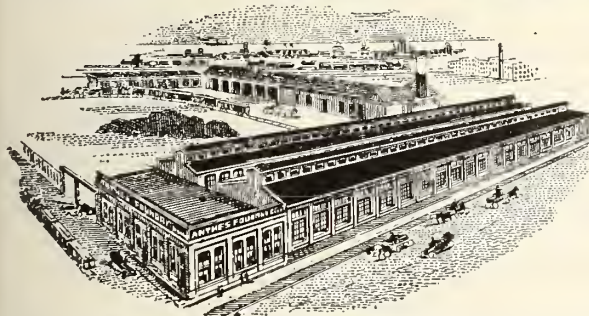
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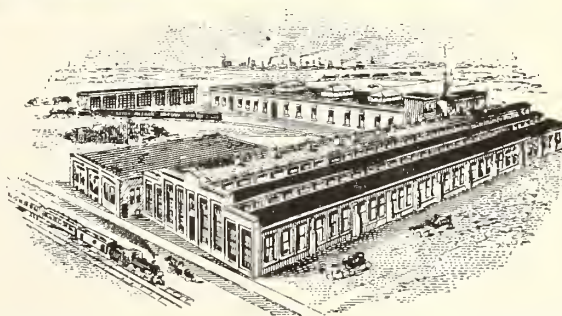
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ANTHES FOUNDRY LIMITED

WINNIPEG



MANUFACTURERS
OF
CAST IRON
SOIL PIPE
AND
FITTINGS



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UNDER THE WINDING-UP ACT.
IN RE

THE STAR IRON COMPANY LIMITED

BEAUHARNOIS, QUE.

In Liquidation.
SEALED TENDERS will be received by the undersigned until

THURSDAY, JUNE 25th, 1914, at Noon, for the purchase of the following assets:

Foundry of 30 tons daily capacity, ready for operation, comprising Grounds, Buildings, Machinery, Patterns, Moulds and Plant, with rights in the water power and leases, situated at Beauharnois, P.Q., as per description to be furnished by the liquidator. The Patterns and Moulds comprise as follows—(a) The Patterns and Moulds for the celebrated "New Star" boiler from No. 0 to No. 10, and all connections. (b) Patterns and Moulds for the "Canada Improved" Radiators, 20 to 45 inches, plain and ornamental. (c) Patterns and Moulds for soil pipe and soil pipe fittings, in sizes 2, 3, 4 and 6 inches, in light, medium, and extra heavy. (d) Patterns and Brass Moulds for full assortment of the "STAR" steam fittings.

The tenders to be made for each lot separately.

A deposit of 10% shall accompany every tender. None of the tenders shall necessarily be accepted.

For all other information apply to
ALEXANDRE DESMARTEAU,
Liquidator.
No. 60 Notre Dame St. East, Montreal.

When writing advertisers kindly
mention having seen the ad.
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DOMESTIC ELECTRICAL WORK BY WILLIAM A. WITTEBECKER. Concise and Practical Explanation for Sanitary Engineers on How to Wire Buildings for Bells, Alarms, Annunciators, and for Gas Lighting from Batteries. The information given is practical, and with a close observance of the directions laid down, any one, though entirely ignorant of electricity, should be able to do the work described. Illustrated with 22 diagrams. Price, in paper, 25c postpaid. Price, in cloth, 50c. MacLean Pub. Co., 143 University Avenue, Toronto.

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Keep in mind the dominant fact that mankind from its first appearance on the earth has been schooled by nature to look for signs; for invitations to taste; for suggestions as to what to wear. Tell your story briefly, forcibly, truthfully, and address it through the proper media and you can successfully apply advertising as a means to increased distribution.



GENUINE ARMSTRONG STOCKS and DIES

FOR THREADING PIPE OR BOLTS

KNOWN, USED,
COMMENDED EVERYWHERE

PIPE MACHINES,
both Hand or Power
HINGED PIPE VISES

PIPE CUTTERS

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BARD ADJUSTABLE
BUSHINGS

Manufactured by

**THE ARMSTRONG M'F'G.
CO.**

317 Knowlton St.

BRIDGEPORT, CONN., U.S.A.
NEW YORK CHICAGO

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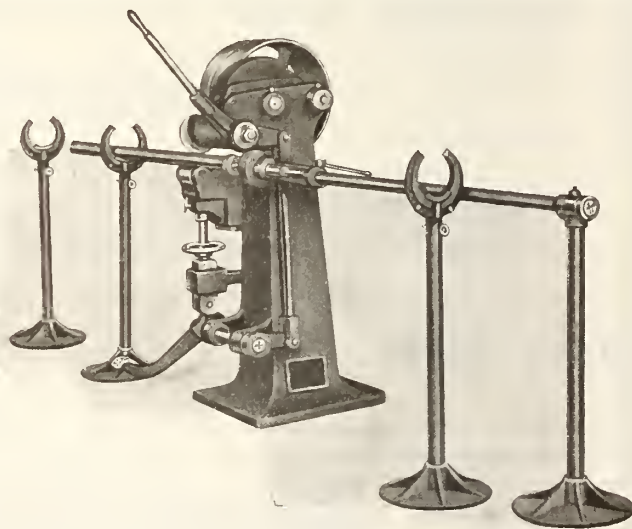
Education an Investment

The Anglo-American Sanitary Correspondence College

undertakes to teach the readers of "Sanitary Engineer" the science of Sanitary Engineering, enabling you to "Know Why" you Vent Traps, when you should Vent Traps, and when you should not.

Director—Professor Arthur Bateman, who has been a practical teacher for eleven years, in four different institutions, in two countries. Booklet and full particulars free to the Plumbing Fraternity. Write—Desk 2 10-12W.

ONTARIO STREET - CHICAGO, ILL.



The Hall No. 2 Rapid Upright Roller Pipe Cutter for Rapid Work and a Clean Cut

By repeated tests this machine has proven the most efficient and economical pipe cutting device on the market, and is used for this purpose by all of the tube mills in Canada and most of the leading plumbing and steam-fitting houses.

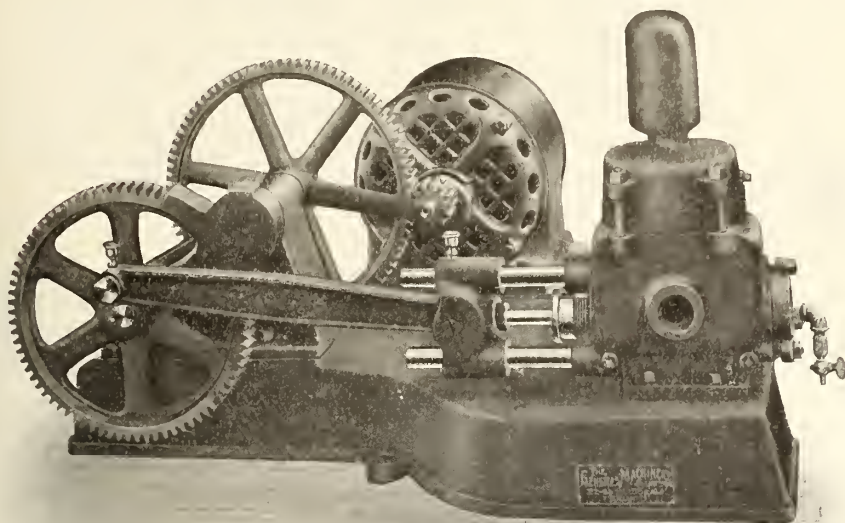
Regular capacity $\frac{1}{2}$ to 2-in., with extra cage will take $\frac{1}{8}$ to $\frac{3}{4}$ -in. pipe.

Write us for catalog and prices on pipe threading lathes, any capacity from $\frac{1}{8}$ to 18-in., also single and double head rapid nipple machines. No delays, delivery from stock.

JOHN H. HALL & SONS, Limited
BRANTFORD, CANADA

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G. M. C. WATER SYSTEMS



The "INVINCIBLE" with direct - connected Electric Motor. A heavy, fool-proof, electric pump for all time service.

All mounted on a heavy Cast Iron Base requiring no foundation.

The General Machinery Co., Limited

22 Mulock Avenue

TORONTO, ONT.

Increase YOUR Profits By Showing Customers How to Save Money

You can do this by simply *proving* to your customers the enormous saving in fuel that can be effected by the use of J-M Pipe Coverings. And we'll help you by supplying you with literature, samples, and actual test figures that will *prove* conclusively to your customers that they are losing good money in fuel on every steam or hot water line that they are operating without the insulating help of

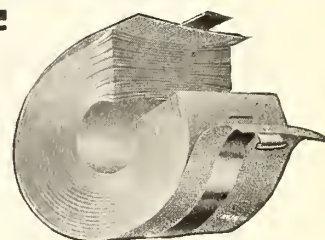
JM PIPE COVERINGS

There is a J-M Covering for every condition, each recognized by engineers as the *most efficient* on the market.

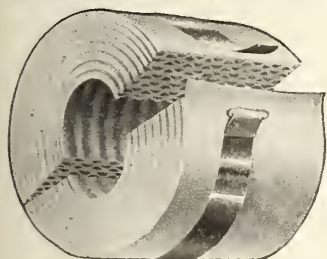
You can reap big profits not only on nearly every piping job you do, but also from hundreds of jobs in old buildings around your city.

Get after this business now. There is bigger profit in it than in most business you get, and competition is not so keen.

Write nearest Branch for our Special Proposition to Plumbers.



J-M Asbesto-Sponge Felted for High Pressure Steam Service.



J-M Asbestocel for Medium and Low Pressure Steam and Hot Water Systems.

THE CANADIAN H. W. JOHNS-MANVILLE CO., Limited

MANUFACTURERS OF PLUMBING FIXTURES; FLUSH VALVES; WASHERLESS FAUCETS; COPPER FLOATS; PIPE JOINT CEMENT; JOINT RUNNERS; PACKINGS; ETC.

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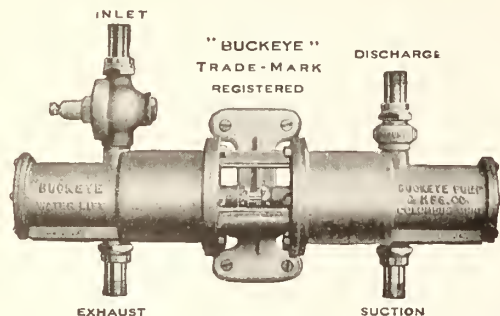
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The "BUCKEYE" Water-Lift Pump



For Automatically supplying cistern water for laundry, bath, etc.

The "Buckeye" delivers the service that builds up your profits. "Buckeye" buyers become "Buckeye" boosters, because:

The operation is positive, economical and noiseless. The construction is simple, practical and durable. The connections are easily get-at-able—see cut. The installation may be either right or left-hand. The pump cannot stop or stick on centre. The pump runs only when cistern water is used. Check valve on pump prevents back pressure on motor.

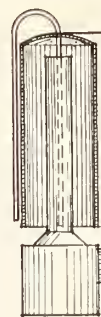
Only seven cup leathers and two stuffing boxes.

The pipe connections are of uniform size.

"Buckeye" means greater water-lift profits.

May we send you catalog and prices?

The Buckeye Pump & Manufacturing Co.
COLUMBUS, OHIO, U.S.A.



MEARNS' SIPHON FOR SEPTIC TANK

This Siphon has no springs or valves—There is nothing to get out of order—Once installed will last practically for ever without any attention—Endorsed by Prof. Starkey of McGill University, Montreal.

Write for Blue Prints and Further Information to

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Instructor in Mechanical Drawing, Massachusetts Institute of Technology

176 pp., 140 illus. Cloth binding. Gives a course of practical instruction in the art of Mechanical Drawing, based on methods that have stood the test of years of experience. Includes orthographic, isometric and oblique projections, shade lines, intersections and developments, lettering, etc., with abundant exercises and plates.

Price, \$1.00

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BUT a man named Thomson was the inventor of the smoke machine they all say is the best. Smoke is no good for anything but testing plumbing, and it is no good for that without a good machine to produce it and pump it. There are lots of machines sold for this purpose, but there is only one Thomson.

It's so small that an apprentice can carry it. It's so simple that he can work it. (Think of that.) It's so strong that he can't break it (without mallet and an axe.) And it is so smooth and easy in its action, so remarkably sensitive, and so reasonable in price no good plumber can afford to be without it.

It is guaranteed for one year, money back if not as represented. And we give away descriptive circulars.

**The James Morrison Brass Mfg.
Co., Limited**

93-97 Adelaide St. W., TORONTO, Can.

THOMSON

For a Good Stop and Waste Cock Use Mueller's 8203

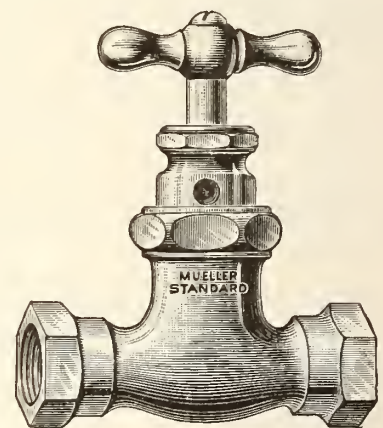
A Compression Stop and Waste Cock that never fails to give satisfaction. It will waste from any angle; and opens on a three-quarter turn of the handle. Many plumbers have adopted it in preference to a ground key cock. Simple in construction and reliable in operation. Give it a trial. You will like it. Mueller Compression Stop and Waste Cocks are made of Mueller High-Grade Red Metal and are UNCONDITIONALLY GUARANTEED.

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Makers of High-Grade Plumbing, Water and Gas Brass Goods.



D8203

S.E.

**H. Mueller
Mfg. Co. Ltd.
SARNIA, ONT.**

Send me catalogue
"D" and quote me
prices on D8203.

Signed.....

City Prov.

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DART Union Pipe Coupling

The kind that leaves no room for complaints and saves time

The **Two Faces of Bronze** when drawn together from a joint that **never corrodes**, nor never leaks till deliberately loosened with a wrench.

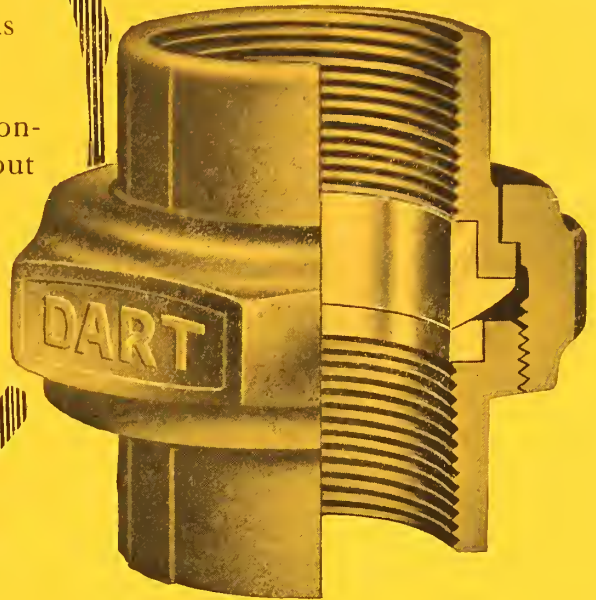
The joint being ball-shaped permits the easy connecting of pipes whether the latter are in or out of line.

The trade-mark "DART" is cast on every Dart Union. It is a **guarantee** that you will immediately get 2 new unions for any defective one.

Ask your jobber for them.

Dart Union Co., Limited

Toronto, Canada

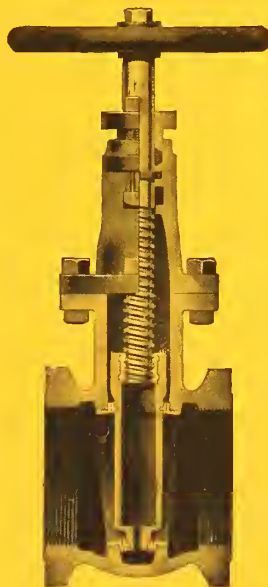


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(New "KEYSTONE" Pattern) GATE VALVES



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If you have been using them, we are confident that our satisfaction will bring us your repeat orders. These valves will never cause you or your customer the slightest trouble. Their high quality is consistent.



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Write us for particulars.

Kerr Engine Co., Ltd.,

Valve Specialists

Walkerville, Ont.

“RAPIDO”

(RAPID OPENING)

SINK BIBB

SET SCREW FLANGE



The design that will please your customers.
Plain Handle and Flange.
Encased Washer.
Anti Splasher.

“ADJUSTO”

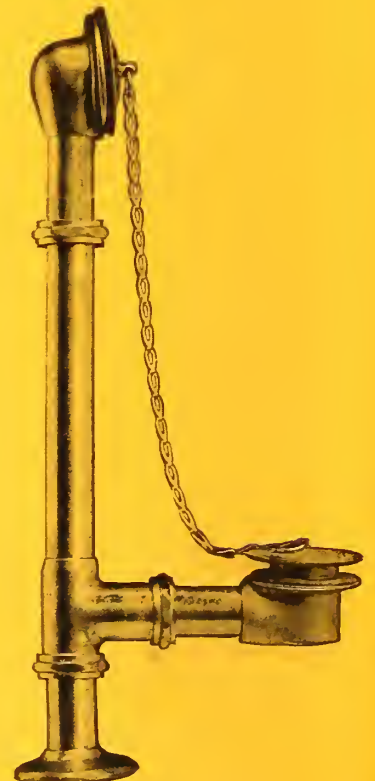
Overflow and Waste Tubes
Telescope 

*“Use Adjusto when in a hurry,
Saves half the time and all the worry.”*

Any article of our make proving defective through inferior metal, or improper workmanship, on our part, will be replaced with TWO good ones, at NO CHARGE to you.

GALT BRASS

Galt, Canada



THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

Publication Office : TORONTO, JULY 15, 1914

No. 14

"HERCULES ENAMEL" LAUNDRY TRAYS With "Cast-In" Washboard



A CHEAP, DURABLE, SANITARY ENAMELED CAST IRON LAUNDRY TRAY To take the place of the brittle, water-logged, unsanitary Cement Tray

After considerable experimenting we have succeeded in producing a Wash Tray which we are able to offer to the trade at a price sufficiently low to interest the many prospective purchasers who cannot afford, or who are unwilling to pay the higher price for our White Porcelain Enameled Trays.

"HERCULES ENAMEL" is totally different from the regular white porcelain enamel, and its composition makes it possible to successfully cover the corrugations of the **CAST-IN WASHBOARD**, which is not feasible with white porcelain enamels. It is the **IDEAL ENAMEL** for Laundry equipment and is capable of withstanding the rapid expansion and contraction usually caused by the alternate use of Boiling Hot and Cold Water.

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It's New—It's Practical and Durable and—It's Cheap. Write for circular and prices.

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Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



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These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

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General Offices and Factory: Amherst, Nova Scotia

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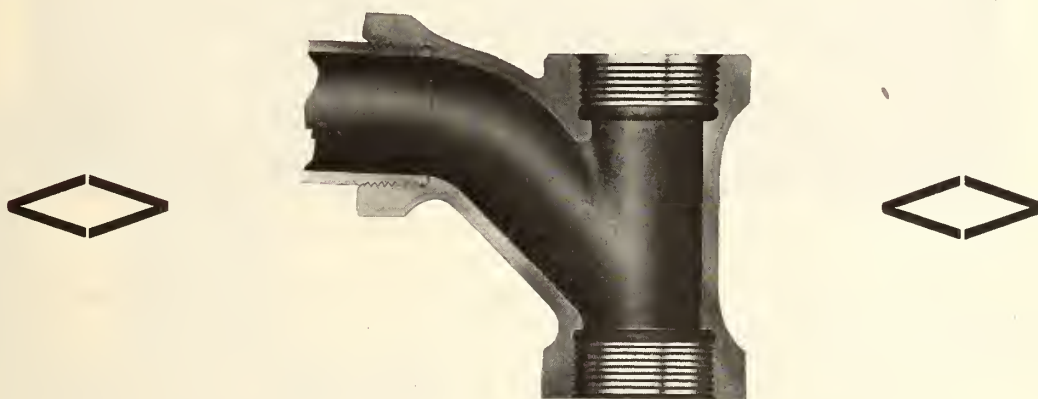
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RECESSED DRAINAGE FITTINGS

**We are now Manufacturing
a complete line**



FITTINGS LIMITED OSHAWA

MONTREAL

WINNIPEG

VANCOUVER

"Standard Sanitary"

Plumbing Fixtures



"Standard Sanitary" Bathroom of Queen Victoria of Spain.

The above cut was made from a photograph of the fixtures actually installed in the Royal Palace of La Magdalena, Santander, Spain, the summer residence of their Majesties, the King and Queen of Spain.

A similar bathroom was also installed for the King, and eighteen other complete "Standard Sanitary" Bathrooms for the other members of the household.

This is an extremely practical and beautiful interior and combines with beauty and refinement every modern sanitary idea.

The fixtures are set into the tiling, thus offering no place for dust or moisture to collect, and reducing cleaning labor to a minimum.

The Foot, Sitz and Shower Baths make an unusually complete and artistic bathroom at a cost that is very reasonable, considering the quality of fixtures shown.

"Standard Sanitary" plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales-agents throughout the Dominion.

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THE DAISY BOILER

Over 55,000 DAISY Boilers

are giving the best of service throughout Canada.

The Daisy has qualities which make it a better proposition than any other on the market.



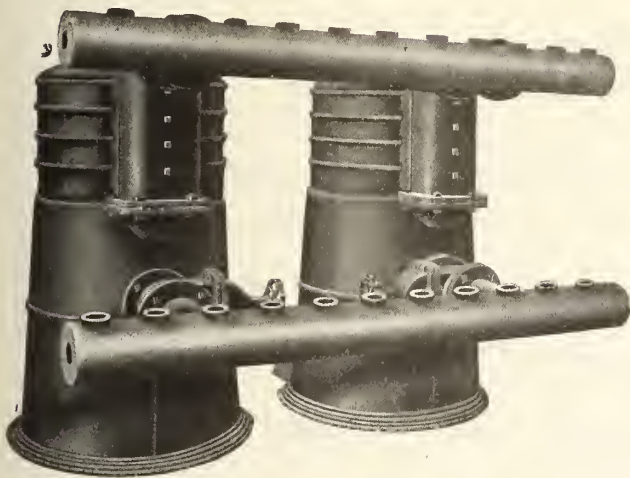
Made in the best equipped plant in Canada.

Without doubt the most popular boiler made.

Every installation means another customer satisfied.

Minimum consumption of fuel.

Maximum amount of heat.



Rear view of two Daisy Boilers connected with twin headers. This system gives great satisfaction in mild and extreme weather.

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Are you seeking some means of improving the efficiency of your plant?

JENKINS BROS.' VALVES



Fig. 106
Standard Pattern
BRASS GLOBE
VALVE, SCREWED

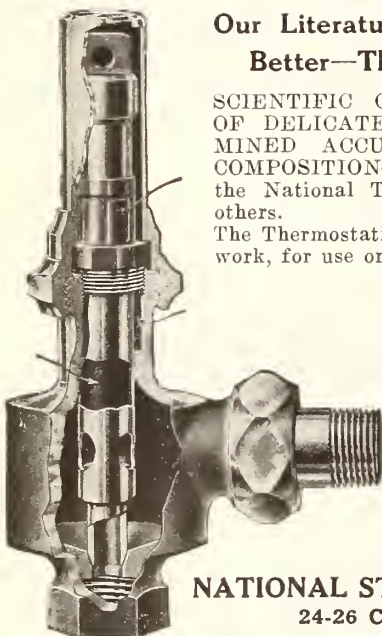
will satisfy your wants because they give the best of service under exacting conditions. Users are unanimous in their testimony to-day—based upon the knowledge of and experience with inferior valves—that there are none to equal the Genuine JENKINS BROS.' VALVES. The Diamond trade-mark is cast on the body of all Genuine valves for your protection.

LOOK FOR IT

Stocked by all first-class dealers. Catalogue sent free upon request.

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103 St. Remi Street . Montreal

National Valves.
Scientifically } Correct
Economically }
Usefully }



Our Literature Tells Why They're
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SCIENTIFIC CONSTRUCTION—ABSENCE OF DELICATE PARTS — PRE-DETERMINED ACCURACY — BRASS-ENCASED COMPOSITION—all of these are features of the National Thermostatic Trap—there are others.

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If you want Perfect Service, based on perfect valve principles, the National Thermostatic Valve will answer this purpose.

Write for our literature on the complete National Line, such as the B Heat Intensifier, B Pipe Joint Compound, "Perfection" Radiator Fitting, etc., etc.

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L. N. Vanstone, 8 Wellington St. East, Toronto
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300,000 lbs.

carried in stock for immediate
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Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

Brass and Copper Rod.

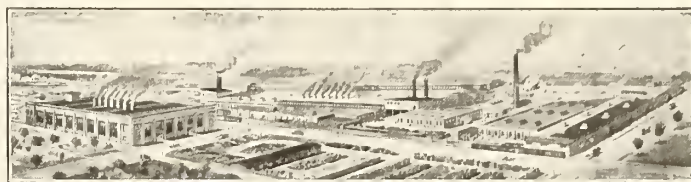
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HAMILTON, ONT.

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The
result
is
bigness



WEST TORONTO PLANT

Where Gurney-Oxford Boilers, Radiators, etc., are made



TORONTO PLANT

Where Stoves, Ranges and Furnaces are made

Here are two "bird's-eyes" of the Gurney plants in Toronto where Gurney-Oxford Boilers, Radiators, Furnaces, Ranges, Stoves are made.

The foundation stone of these buildings is set in the confidence of those plumbers and steamfitters who sell Gurney-Oxford goods. In a small, unprepossessing shed we started out in 1843 to gain this confidence—and bigness is the result.

These views are printed to confirm our original belief that Quality maintained is the biggest constructive force in merchandising.

ESTABLISHED 1843



The Gurney Foundry Co.
Limited

TORONTO

CANADA



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is composed of a vertical cylinder from four to six feet long, according to size. The cylinder contains brass pipes which receive the steam and transmit heat to the water. These pipes are screwed to the base chamber, but remain independent from one another at the top, consequently, the expansion is entirely free, and leaks are impossible.

FULLY GUARANTEED
MANUFACTURED BY
THE E. S. MANNY CO.,
MONTREAL

**4 kinds of
HANGERS**

for hanging up anything from an 8" pipe to a canary bird. Adapted for hanging steam pipes, and they can be adjusted so as to get the proper dip.

PERFECTION FLOOR AND CEILING PLATES

Sizes from 3/4" to 4". 300,000 in stock. We manufacture all lines shown on cut, and can make prompt delivery.

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MANUFACTURING CO.**
New Britain, Conn.

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WOLVERINE

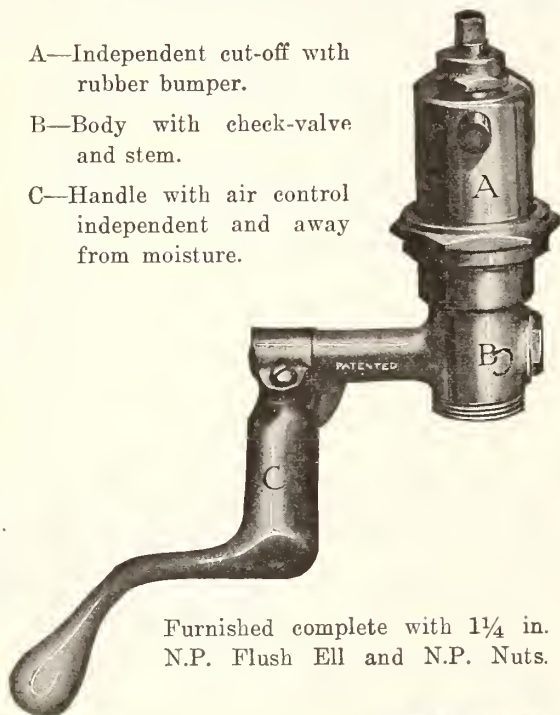
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Wolverine Flush Valve

PATENTED

Durable - Inexpensive - Economical - Simple

- A—Independent cut-off with rubber bumper.
- B—Body with cheek-valve and stem.
- C—Handle with air control independent and away from moisture.



Furnished complete with 1 1/4 in.
N.P. Flush Ell and N.P. Nuts.

The only Direct valve on the market. No small by-passes to stop up or corrode and each valve is furnished with independent cut-off with rubber seat bumper.

Flush can be adjusted without shutting off the water.

For Direct pressure or gravity systems. Write us for price and further information.

Manufactured and guaranteed by

Canadian Wolverine Co.
LIMITED

Chatham Ont.

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BY

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103 Illustrations

6 Plates

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A Volume of 455 Pages.

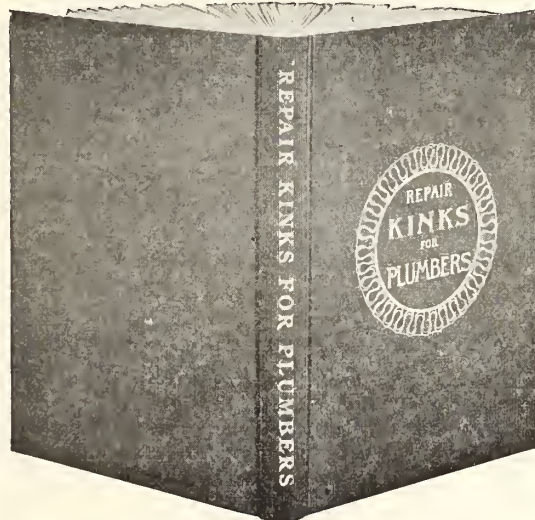
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It will appeal especially to the man controlling a repair business. It will be equally useful to those in charge of buildings. Its table of contents gives some idea of its great scope, no less than 26 subjects being mentioned. Here are some of them:



The matter of taking up the repair of the appliance most commonly out of order, the Kitchen Sink; The Service Pipe, methods of freezing for repair work, etc.; Fuller Bibbs are touched on, as are also leaky Waste Connections; a clear and concise description is given of the action of Flushometers.

Space will not permit us enumerating further the many questions, etc., which are treated very fully in this extremely practical and valuable book. Price 50c postpaid.

We also have technical books on practically every subject pertaining to the heating, lighting, ventilation and sheet metal trades. Write us for list.

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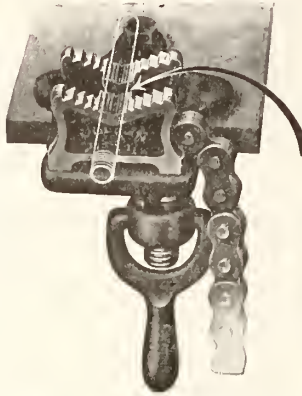
Williams Unusual "VULCAN"!



BECAUSE "VULCAN" Vises are unbreakable in service.

BECAUSE no other vise will hold irregular shapes as well. Either Fittings or Pipe are "meat" for the "VULCAN."

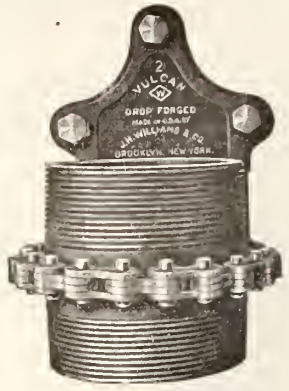
Send for Dependable Chain Tools Pamphlet or consult your dealer.



BECAUSE if you wish to bend pipe, no other Vise will help as much. Use an eye-bolt in one of "staying" the pipe.

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3 sizes, capacities 1/8 to 8" pipe.



J. H. Williams & Co., Superior Drop-Forgings 77 Richards Street, Brooklyn, N. Y. City.

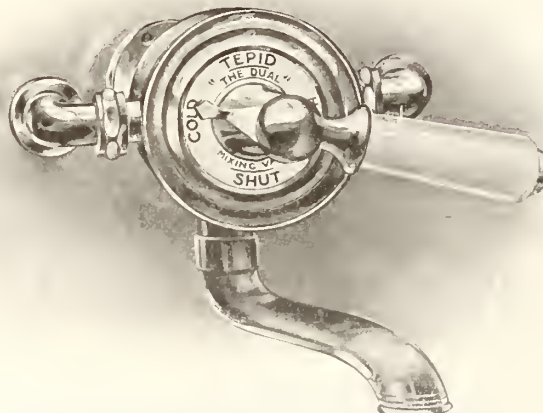
THE "DUAL" VALVE

The
Finest Industrial
Bath Installation in
EUROPE

is at

Messrs. Brunner
Mond Co.,
Northwich, Eng.

where 2000 employees are provided for by these mixers.



Strong and well built, made to stand hard usage.

It can be taken to pieces without disturbing connections.

Made in various types for baths, lavatories, showers, etc.

Send for descriptive booklet.

Made by GUMMERS LIMITED—Effingham Brass Works—ROTHERHAM, ENGLAND.

Canadian Agent:—GEO. CARPENTER, 314 University Street - MONTREAL

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



Brand

CANADIAN TUBE & IRON CO., LIMITED
Montreal Works: Lachine Canal

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¶ *Do you ever feel that your present occupation prevents the development of your business talent?*

¶ *Many a young man is engaged in office or store clerking. Owing to the nature of the business, he has but a narrow range in which to exercise his talent. He cannot relinquish his position to seek one giving better opportunities and paying a larger salary. To do so would be to give up his only source of revenue, and someone may need his support. Yet it is imperative that he increase not only his business, but also his salary.*

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MacLean Publishing Co.,

143 University Ave.

Cir. Dept.

TORONTO



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THEN—

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Embodying the results of 50 years in making great files,

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"File Philosophy"—A 50 years' education on files in an hour, and our Catalog, sent FREE on request.



SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, JULY 15, 1914

No. 14

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No joints to open up.
No linings to leak.

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STEEL AND RADIATION, LIMITED

"KING" BOILERS



No. 6. High Base "KING" Boiler, Showing Double Shaker.

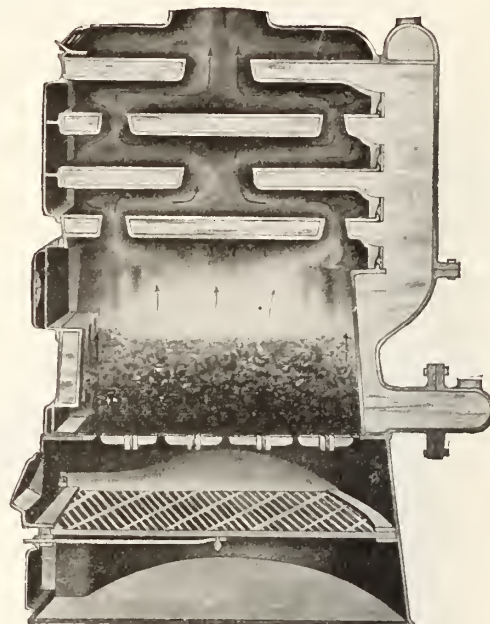
A Hot Water Boiler That Is Standing The Test.

"KING" Boilers carry our unqualified guarantee.

Mr. Heating Engineer,—

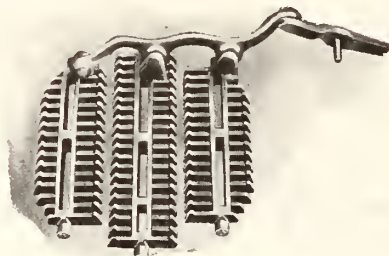
Isn't it worth something to deal with a house that has faith in its product and will stand behind the goods they manufacture?

The talking points on a "KING" Boiler are numerous, in fact too numerous for us to attempt to explain them in this limited space. A few of them need no explanation and are shown in the accompanying cuts.



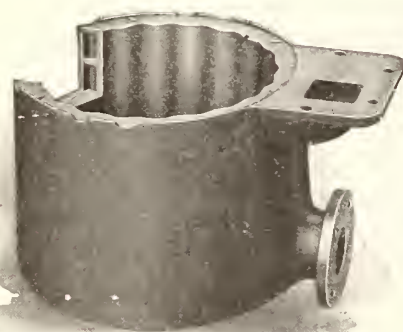
Sectional View of "KING" Boiler, Showing Improved Design of Waterways, Combustion Chamber and Fire Travel.

The large one-piece ashpit.
The special shaking grates and convenient shaking arrangement.
The fire-pot with a real corrugation.
The well-arranged and properly proportioned combustion spaces.
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The double shaker.



Grate Bars and Connecting Bar, Showing Method of Connection Without Bolts or Pins.

The perfect fit doors.
The thin and rapid circulating waterways.
The extended and scientifically arranged heating surfaces.
The absence of defective sections on account of the use of iron patterns.
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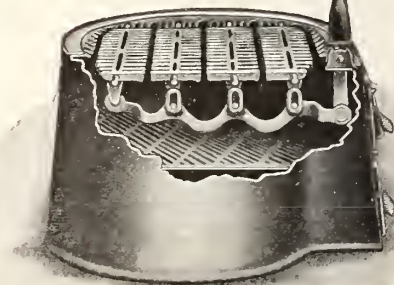


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THE SANITARY ENGINEER

VOL. VIII.

JULY 15, 1914.

No. 14

Methods of Sewage Disposal in Canada

Showing That the Disposal of Sewage in Canada is a Subject Which Cannot be Copied From Other Countries, Because of the Varied Climatic Conditions Which Prevail, in Fact, Different, One Method May Be Satisfactory in One Part of Canada and Not in Another.

*By T. Aird Murray, M. Can. Soc. C.E. in Contract Record.

Chief Features of Sewage Disposal.

Sewage, as has been stated, is water containing organic solids in suspension, organic matter in liquid form either as a solution or chemical compound, and sewage bacteria. There are thus three distinct classes of objectionable ingredients in sewage, each of which requires a separate character of treatment; viz., organic solids, organic liquid and bacteria. If the sewage is allowed to enter a lake or slow-running stream, a large proportion of the solids settle by gravity to the bottom, where it gradually rots, a proportion of the solids floating to the surface. The liquid organic matter gradually mixes with the water and is oxidized if sufficient dissolved oxygen is present; otherwise it sets up putrefactive conditions. The sewage bacteria gradually die out, but may maintain their vitality for several weeks. Essentially sewage treatment is in line with the first two of the above processes. The solids are separated by gravity and the liquid organic matter is oxidized. The bacteria, however, are not allowed to die at their leisure, but are eliminated by disinfection. The resultant liquid, freed from solids, incapable of further putre-

faction and free of sewage bacteria, may then be turned into a stream or lake with impunity. The trouble in the past has been how to efficiently obtain the desired result without nuisance, and without too great a cost commensurate with the results.

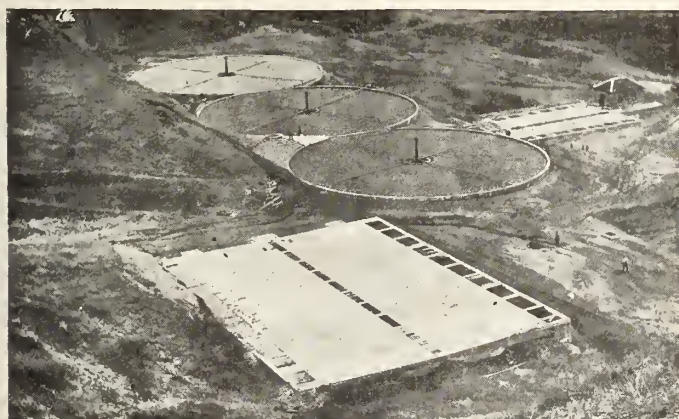
The Septic Tank.

The old "septic tank" has suffered more from exaggerated claims which engineers put forward with reference to its supposed capabilities than it should have done if its limitations had been thoroughly understood. A septic tank is nothing more, and can be nothing more, than a tank or receptacle in which the suspended solids in part settle to the base of the tank and in part float upon the surface. The tank in its operation did not oxidize the organic matters in solution, or so change the liquid sewage to an extent to obviate the esthetic nuisance attending its final discharge. The sewage bacteria were not eliminated, and under the most favorable conditions the discharge remained sewage, in most cases providing foul odors which were not even appreciable with the fresh sewage entering the tank.

The original claim by the patentees

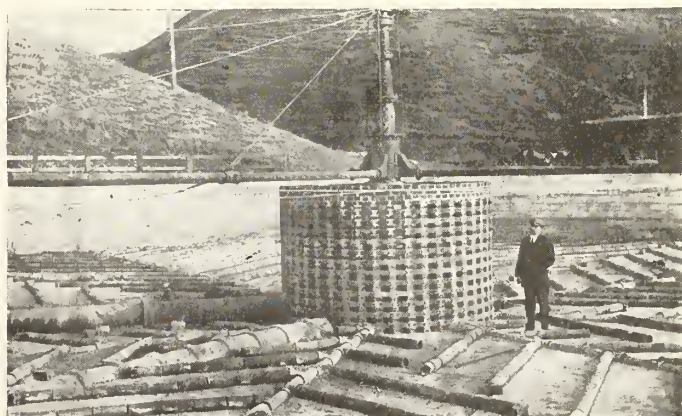
of the septic tank was simply that the organic solids retained by gravity in the tank, if allowed sufficient time, would by a putrefactive process rot to the extent of elimination, and thus the visible matters in sewage could automatically be dealt with. This claim, however, has been only partially met in practice to the extent of about twenty to thirty per cent. elimination of the retained solids. The septic tank has proven itself an inefficient machine for even the purpose for which it was designed. On the other hand, the principle of its action upon solids is the basic principle of the newest type of sewage settling tanks.

Upon the publication of "The Fifth Report of the Royal Commission on Sewage Disposal," in which the limitations of the septic tank were precisely demonstrated, it became apparent that the failure of the tank as a separator of suspended solids lay in the principle of construction, by which the settled solids while undergoing putrefaction were constantly in contact with the fresh flowing sewage, and that if the solids immediately upon settlement could be removed from the settling basin to a



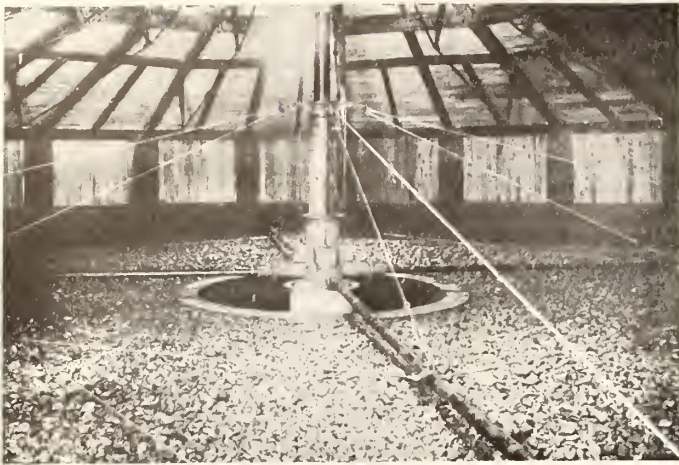
LETHBRIDGE SEWAGE DISPOSAL WORKS.

Sludge separator tanks and filters complete with humus tanks and chlorine house.



LETHBRIDGE SEWAGE DISPOSAL WORKS.

Under-drains and distributor for filter.



SEWAGE DISPOSAL WORKS, WESTON, ONT.
Sprinkling filter.



SLUDGE SEPARATOR TANKS, WESTON, ONT.
One unit full.

separate tank many of the inherent objections to the septic tank could be obviated.

The Modern Sludge Separator Tank.

The old septic tank is really the father of the modern "Sludge Separator Tank" or "Two-Storey Tank," as it is sometimes called, the solids of the sewage being retained and allowed to rot by the natural process of putrefaction. Drs. Travis, of England, and Imhoff, of Germany, were among the first to introduce "Sludge Separator Tanks" in Europe, while Rudolph Hering has taken the matter up very strongly in the United States. The first "sludge separator tank" on the two-storey principle installed in Canada was designed by the author in 1910 for the city of Lethbridge, Alta. The principle of the "Sludge Separator Tank" is now generally accepted by engineers and health authorities as an efficient machine for the retention and treatment of the suspended solids in sewage and although the construction lends itself to variety in design in minor points, the principle of immediate removal of the precipitated solids to a separate chamber and from contact with the continuous flowing fresh sewage is common to all.

One of the illustrations shows a plan and section of an improved "sludge separator tank" of the rectangular type, representing, generally, the design now adopted by the author. The unit consists of duplicate settling basins capable of dealing with the sewage of from three to four thousand population. The sewage is shown to enter first a chlorine treatment chamber from which it is conveyed by feed pipes to an inlet channel baffled by a submerged weir. The weir is carried along the full length of the tank and the flow is directed across the narrow width of the tank to an outlet channel near the center. The cross section through the tank A to B shows the submerged weir, outlet baffle or scum board, and outlet channel, together with

the triangular section used as a settling basin. The velocity of the sewage flow is reduced to almost quiescence in its passage through the settling basin. The settling solids pass through the opening at the base of the settling chamber into the separate sludge storage area, which is common to both settling basins. The sludge storage area is open to the surface for the whole length of the tank to a width of about two feet six inches providing ventilation and control. The cubic area for sludge storage is equal to about four months' collection of solids, this being considered a sufficient length of time to allow of thorough putrefaction. During the process of putrefaction, the gases or products cannot come into contact with the fresh-flowing liquid sewage. The solids are periodically removed from the tank by opening the valve shown and the pressure due to the head of water in the tank above the sludge outlet forces the sludge to drying beds constructed alongside the tank. The resultant sludge from storage basins, constructed as shown, is odorless and when allowed to dry in beds resembles earth humus.

An interesting feature in connection with the tank as illustrated is that the chlorine is applied before the raw sewage enters the settling tanks, and not afterwards, as is generally the custom. It has been demonstrated by the experts employed by the Provincial Board of Health of Ontario at their experimental station that it requires less—or at least no more—chlorine to disinfect the liquid sewage before it enters the tank than after, and that the lime acts as a precipitant upon the solids. The theory appears to be based upon the principle that fresh liquid sewage requires less chlorine than when stale and that the object should be to bring chlorine into contact with the fresh sewage liquid as early as practicable. The solids are, of course, not disinfected and settle with their contained bacteria to the storage

basin. In treating water for domestic supply with calcium hypochlorite, it is necessary to settle out the lime before introducing the chlorine, but with the sewage both the chlorine and the lime may be added together and so the well-known precipitating value of the lime is utilized in obtaining a greater percentage of settling solids than might otherwise be the case.

Assuming that three parts per million of free chlorine are necessary to disinfect the liquid sewage and the chloride of lime contains 33 per cent. of free chlorine, then it would require 9 lb. of sewage, or 90 lb. of chloride of lime for every 1,000,000 lb. of sewage, or 90 lb. of chloride of lime for every 1,000,000 gallons of sewage. This means that 60 lb. of lime can be utilized to aid precipitation, which is otherwise a waste product if disinfection is applied as a final treatment.

The liquid effluent from these tanks may ordinarily be turned into a stream or body of water, when the dilution is greater than one volume of liquid sewage to thirty of water, without creating any esthetic nuisance. The velocity of flow in a stream, and the efficiency of the method of obtaining dispersion of the liquid sewage in order to obtain the maximum amount or dilution at once, are important factors for consideration. The amount of solids which are settled out average about from 80 to 90 per cent. of the solids which are capable of settling and from 60 to 70 per cent. of the total suspended solids. The effluent continues to contain a proportion of the finer solids, especially those of a specific gravity practically equal to water, which, although not visible in the effluent, will in a stream form objectionable deposits.

Modern Sprinkling Filters.

When it is desired to obtain a liquid effluent which is no longer organic in the sense that it is subject to putrefaction,



SEWAGE DISPOSAL WORKS, WESTON, ONT.
One unit empty.



LETHBRIDGE SEWAGE DISPOSAL WORKS.
Filters operating in winter and giving efficient results.

and which will practically make no demand upon the dissolved oxygen of the water receiving the effluent, the sewage liquid from the tanks may be oxidized by passing it through what are termed "sprinkling filters." There are several installations of these filters both in eastern and western Canada and in spite of the severity of our winters they have proved efficient. The filters are composed of a depth of about six feet of broken stone, slag or other hard material of a rough character averaging in size usually from one to two-inch cubes. The rate of filtration at six feet in depth may for ordinary domestic sewage be at about two million gallons of sewage per acre per day, depending, however, upon the organic strength of the sewage as represented by the number of persons connected with the sewers.

The liquid sewage is sprayed over the surface of the filter and percolates slowly to the base, which is very thoroughly drained to the center. The voids of the filter material are from 50 to 60 per cent. of the cubic area. Not more than 20 per cent. of the voids should at any time be taken up with sewage, the remaining 30 per cent. being taken up with air. The liquid sewage in passing through the filter comes into contact with the oxygen of the air, absorbing it, the character of the organic matter being changed and rendered inoffensive. The fine suspended matter not retained by the settling tank is caught by the surfaces of the filtering material and as it is mineralized it is washed away through the underdrains and generally allowed to settle out by aid of a final settling tank called the "Humus Settling Tank."

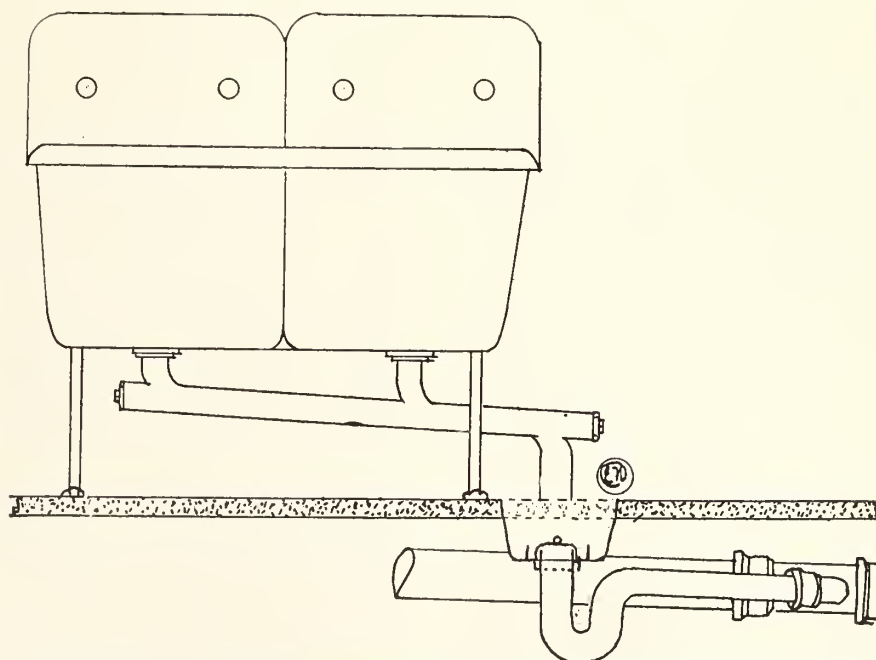
Complete System of Sewage Disposal.

It will be seen from the above that a complete system of sewage disposal may consist of (a) "Sludge Separator Tanks" removing the bulk of the suspended solids; (b) "Oxidizing Filters" for the treatment of the liquid sewage; (c) "Humus Settling Tanks" for the

removal of the finer suspended matter caught by the filters and given off by the underdrains, and (d) Chlorine treatment for the final disinfection of the effluent. There are cases where the requirements may only call for "a," for "a" and "b," or for "a" and "d," and municipalities must rely upon expert advice in this connection. Two complete sewage disposal installations in Canada have lately been the object of several visiting deputations from other municipalities; viz., Weston, near Toronto, and Lethbridge, in Alberta. It is well for those administering civic matters to make themselves acquainted with the practical working parts of an installation before going into the matter. Much is gained by a visit to works where the whole principle can be explained and the results seen and demonstrated. The cost of sewage disposal varies considerably per capital, depend-

ing upon the availability of the site, and the amount and character of treatment required. At Weston the plant as constructed will deal with the sewage of 5,000 population at a construction cost of \$3.40 per head. At Lethbridge the capacity is for 20,000 population and the cost \$3.00 per head. In both cases the system is complete, but pumping is not necessary, and the sites are ideal for the purpose. As a height of from eight to ten feet between the outlet sewer and the effluent discharge is required in order to treat sewage by "a," "b," "c," and "d," as above described, in many cases low lift pumping is a necessity. When "a" and "d" only are required—that is, when the filters can be left out—a height of two feet is ample. The combination of "a" and "d" is, therefore, more applicable to municipalities located with lake frontages.

(Continued on page 29.)



Simple method of installing laundry tubs in basement. No need to make a waste connection to drain, this method would preserve the seal in the basement floor trap.

Sanitary Engineers and Overhead Expenses

Being a Further Discussion on the Way Sanitary Engineers Should Figure Overhead Expenses—Referring to the Question Raised by L. Legrow in an Article Which Appeared in Last Issue of Sanitary Engineer.

THE question of what items of expenditure may be properly classed as overhead expenses, and the methods of figuring the cost of doing business, have been much discussed in all lines of trade during recent years, and the discussions have been of great practical benefit to all concerned. Members of the Master Plumbers' Association of Montreal have listened on a number of occasions to talks on this subject by some of its members. J. E. Walsh, of M. Walsh & Co., Ltd., has given the matter considerable study, and he looks forward to the time when every sanitary engineer will be able to say just exactly what it costs him to do business and the amount of profit he has actually made on the year's work.

Knowing his interest in the subject, a representative of Sanitary Engineer asked Mr. Walsh his views on the article which appeared in the June 15th issue by Lewis LeGrow, of Toronto. Mr. Walsh remarked that he had read the article with considerable interest.

"We have often been favored," he said, "with pearls of wisdom from the pen and lips of Mr. LeGrow, whose energy, aggressiveness and manly methods as a sanitarian have done much to insure the progress of both the National and Ontario organizations, yet notwithstanding the sincere admiration and friendship I feel for him, I find it necessary to disagree with him in some of the statements he makes in his paper on 'Overhead Expenses.'"

"Although it is apparent that Mr. LeGrow's object was simply to start the ball a-rolling, it would have been more satisfactory had he gone more fully into details, as the finished article is what we naturally expect from him.

"The itemized list of expenses, at least from the Quebec point of view, can be safely added to, as no allowances appear for such items as: 1, the interest on capital invested; 2, employers' liability insurance; 3, water, business and licence taxes; 4, fuel; 5 donations (to hospitals, charity, etc.); 6, upkeep of horses and vehicles or motors; 7, collection of accounts, etc.

"If these items were added, the expense of doing work would total 20 per cent., if not more. Besides, it is impossible to accurately estimate the losses of the 'jobbing men' through shop time and the 'contract men' through damage charges, mulcted sometimes through no real fault of theirs. Stock companies

likewise have special government taxes to pay, and employers legitimate personal disbursements to make in order to secure business.

"All things considered, 20 per cent. on the gross amount of business, not on the net cost, would prove a fairer average. And herein lies the great difference.

"The overhead expenses are estimated on the gross returns, not on the wholesale cost of the article—that is, your expenses are reckoned not on your purchase price, but on your selling price. The same argument likewise really applies to your profits. When an employer states he made 10 per cent. last year in his business, he means 10 per cent. on the amount of his sales, not of his purchases. To illustrate: If he did \$15,000 worth of business and made 10 per cent., we naturally assume he made \$1,500. The affirmation, therefore, that adding the actual percentage of overhead expenses to the cost of time and material, and then adding the anticipated percentage of profit is the proper mode of procedure, is entirely erroneous and misleading. An example will place the matter more clearly before your readers. Take the figures already submitted:

Amt. of Overhead	Profit (Anti-Business. Charges. eipated.)
\$15,000	\$2,550, or 17%
	\$1,500, or 10%

"The net cost of time and material would be \$15,000 (less \$2,550, plus \$1,500), or \$15,000, minus \$4,050, equaling \$10,950.

"Should we then add 17 per cent. to the cost, \$10,950, we would be allowing \$1,861.50 as overhead charges, not \$2,550; and should we likewise add 10 per cent. as profit to \$10,950, plus \$1,861.50, or \$12,811.50, we would problematically earn \$1,281.15, not \$1,500. Our selling price then would be \$12,811.50, plus \$1,281.15, or \$14,092.65, instead of \$15,000; and our real profit, exclusive of accidents or mistakes, about \$592.65, or 4 per cent., that is allowing for exact overhead expenses of \$2,550.

"Legally, it is understood the contractor is entitled to 20 per cent. profit. Bear in mind, moreover, that many large stores advertise a genuine reduction of 50 per cent. on their selling price and yet make a profit. Just fancy 50 per cent. on the selling price, which should be equal at least to 100 per cent. on the cost. Is 20 per cent., therefore, too much profit to anticipate? The \$15,000 business should be illustrated as follows:

\$15,000	20% expenses	\$3,000
	20% profit	3,000
	Total	\$6,000

Cost, \$15,000—\$6,000, or \$9,000.

To achieve 20 per cent. profit, therefore, \$6,000 must be added to \$9,000—that is, 66 2/3, or 2/3 of the whole.

1/3 for expenses, which would bring the cost to \$12,000 and 25 per cent., or a quarter of \$12,000 (\$3,000), which would bring the total to \$15,000, say, 66 2/3 of the cost, or 33 1/3 and 25 per cent.

Take a \$50,000 business where expenses should be less, say, 15 per cent.—\$50,000.

Expenses, 15%	\$ 7,500
Profit, 20%	10,000
	<u>\$17,500</u>

Cost of material and time, \$50,000, less \$17,500, or \$32,500. Therefore, 23.30 per cent. has to be added to attain 20 per cent., or \$10,000 profit.

"Sanitary and heating engineers might find it profitable to study these figures, principally those who are content to add 10 per cent. to the cost of time and material to secure a contract.

"I would suggest that a page or column in Sanitary Engineer be devoted to single out the items which comprise overhead expenses. I have enumerated a number of items which I think should be included under this head, and there are probably others that could be listed. Invite the engineers to add to or correct these items, and then when you have a complete list, have figures filled in showing the cost of doing business from \$15,000 to \$500,000 a year, and then you will have a real indication of the charges for overhead expenses."

Mr. Walsh said he might go more into details about some of the items and figures he mentioned, but he hoped other sanitary engineers would express their views, as this was a matter in which all are interested; and if this were done it would bring the matter more clearly before the readers of this paper.

"In any event," said Mr. Walsh, in conclusion, "if the overhead charges are estimated on the gross business, see that sufficient margin is allowed on the cost, otherwise estimate the overhead charges on the cost and then simply add it to the cost. Make your profit what you wish, say, 5, 10, 15 or 20 per cent., but be certain that it is based either on your purchase or selling price and act accordingly."

Waste of Water in Canadian and American Cities

Europeans More Economical—Metered Supply Restrains Waste, Yet is Cheaper to Householder—Meters Are Charged to Property Owners and Water Rates Are More Equitable All Round.

THE average Canadian and American citizen is wantonly wasteful in the use of water. Statistics of water consumption show a great difference between the amount consumed by cities in Europe and in America. The average daily consumption in seventeen large cities in England, Germany and France is about 37 gallons per capita, the highest being about 66 gallons, at Glasgow, and the lowest about 20 gallons, at Nuremberg. The per capita consumption in the average American or Canadian city is nearly four times as great. In New York the daily consumption is about 130 gallons per capita; in Chicago, Philadelphia and Pittsburg, it is close to 200 gallons.

The excess of the per capita consumption of water in America over Europe can be traced almost directly to the personal habits and financial status of the two peoples. Although water for toilet use should not be stinted in amount, and although there is no disposition among the advocates of water economy to discourage habits of cleanliness, it is a fact, established beyond all disproof, that the present consumption is largely in excess of the amount necessary to secure the desired end. Consequently the use of water meters on house service has become very common, not, it should be emphasized, to reduce the necessary consumption, but to impart to the householder the habit of giving thought to needless waste.

Every house in the village of East Syracuse, N.Y., has a metered water supply. The meters, which cost \$8.50 each, are charged to the property owners.

The inordinate waste of water by the consumers forced the Water Commission to take action. During a recent water famine in the village, they willfully disregarded the orders of the commission to conserve the supply and used more than three times as much water as was deemed necessary.

Two objections are urged by those who oppose the introduction of water meters.

(1) Many claims relative to their alleged disease-breeding qualities have been made, but all have been shown to be absolutely unfounded.

(2) The most common and the most sincere objection advanced by uninformed persons is that, with metered services, the charge for water results in

diminished personal cleanliness, which might contribute indirectly to disease. There is no evidence that such an effect was ever produced and a moment's consideration will show that such an occurrence is most unlikely. The difference between personal cleanliness and personal uncleanness is represented by such a small amount of water that it is negligible.

Many opponents of meters who base their objection on the ground of cost to the poor man are in ignorance of the fact that the minimum rate under the metered system is so low that the poor

Every municipality in Canada, having a public water supply, would do well to install water meters. No one begrudges water that is used for domestic and commercial purposes, but the people generally suffer financially by reason of the unwarrantable waste which unfortunately is to be noted everywhere.

Not only is such waste very costly but it is also a source of trouble where sewage disposal plants are in operation. When a sewage disposal plant is overloaded with liquid the beds become water-logged. Therefore, as we stated before, there is a medium in all

AVERAGE PER CAPITA CONSUMPTION OF WATER IN REPRESENTATIVE CANADIAN AND AMERICAN CITIES.

Region	Number of cities	Daily consumption in gals. per capita
Canada	9	108
New England	49	86
Middle Atlantic states	44	137
South Atlantic States	15	90
Ohio valley	55	88
Upper Mississippi valley	53	73
Lower Mississippi and Gulf region	6	53
Rocky Mountain region	5	283
Pacific coast	5	204
Total	241	100*

* Weighted average.

man actually effects a saving, and, furthermore, the amount usable for the minimum rate is ample for ordinary use—but not for wasteful use.

The city of Milwaukee, Wis., has a population of 374,000. Last year 2 per cent. of the population paid less than 50 cents; 11 per cent. paid between 50 cents and \$1.00; 26 per cent. paid between \$1.00 and \$2.00, and 18 per cent. paid between \$2.00 and \$3.00. In other words, 58 per cent. of the people in Milwaukee paid less than \$3.00 for their water and 70 per cent. paid less than \$4.00; while the 100 largest consumers paid nearly half the entire revenue of the water department for 1912.

Does that look like discrimination against the poor man?

In what city in Canada can the poor man get his domestic water supply for less than \$1.00?

things. It seems a shame first to have to install large pumping stations which are one of the most costly parts of municipal engineering, then have to provide extraordinary large filtering beds to take care of the water that is wasted and which costs money to supply. The leaking ball cock is about the costliest piece of mechanism in a home.



SECURED GOVERNMENT CONTRACT.

Messrs. Johnson & Coughlin of Edmonton have secured the work of installing the plumbing, heating and ventilation for the new prison to be built at Fort Saskatchewan by the Government. The building will include dormitories, administration building and cell block. It is to be a four-story building, 320 feet long.

Domestic Hot Water Supply Problems

A Series of Articles Dealing With the Problem of Hot Water Supplies, Range Boiler Connections, in Several Forms and Methods Adopted as a Means of Heating Water Under Various Conditions.

ARTICLE 3.

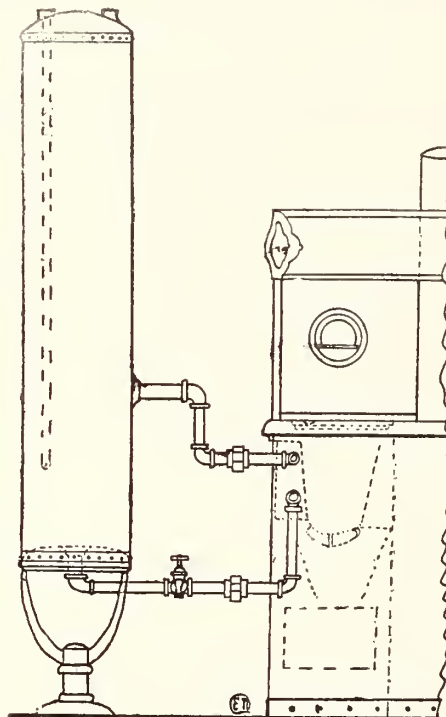
IN our two previous articles we discussed the general principles of heat-water and the cause of circulation, showing how some systems for heating water gave better results than others, and the reasons why they did. We will now show a few of the various methods adopted under different conditions, and the way to take measurements, so as to save time in fitting up same.

Fig 1 is a simple range connection between a water front and range boiler, but before we go into this we will make a few remarks regarding fittings and dies. There is and always will be some slight variations in the tappings of different fittings, this is due to the taps which are used becoming slightly dulled by use, and also by their expanding a little, and all such conditions cause slight variations when measurements are being taken. This is not so noticeable when elbows are being used because the direction is then altered and the fitter can take his measurements end to centre.

Then again there are many troublesome dies, though in these days this should not be the case, seeing that many splendid dies and die stocks are to be had. In spite of this fact, however, it is lamentable to see the number of old die stocks which are still used, and should have been on the scrap-heap long ago. The writer has in mind one or two firms employing several hundred men, who are still using the old solid die and stock for threading pipe up to two inches, and these same old-style dies take two strong men to thread a $1\frac{1}{2}$ in. or 2 in. pipe. This class of tool is responsible for a lot of wasted time and energy, as well as scores of leaks, split piping and "cuss" words. Hence they should be scrapped. There are dies and stocks to be had which will save their price in one week of continuous use, as well as giving better constructional results.

Then there is the cutter. This tool is as important as any tool the sanitary and heating engineer uses. If a wheel cutter is used, then the pipe should be well reamed, so as to eliminate any obstruction in the interior of the piping, and obstruction on a range boiler connection is a great evil. If a dull cutter is used there is bound to be a heavy burr on the pipe, which reduces the inside diameter, and in that way causes obstruction. It not only does this, but, at the end where the burr is formed a large surface of

pipe is susceptible to rusting, and this formation or rust further impedes the flow of water thus causing circulation to be sluggish. Many a time has the writer taken out a range connection which has been simply blocked up at each cut of the pipe, and when putting in a new connection has proved to his own, as well as to the satisfaction of his customer, the necessity of reaming the pipe if wheel cutter has been used. However, this trouble of reaming may be overcome in these days. Manufac-



turers have placed various kinds of cutters on the market which do not make burrs on pipe when cutting, thus saving time and giving the public a better installation at a less cost. Therefore we would urge that all employers should see that their employees are supplied with the best tools, so that the best and most satisfactory results may be got from them.

Now for the taking of measurements for this range connection. All these range boilers, say 30-gallon size, are tapped for 1-inch pipe. A 1-inch nipple should therefore be inserted into the bottom of the boiler with 1-inch x $\frac{3}{4}$ -inch reducing elbow. All fittings and pipe should be either galvanized iron; the 1-inch nipple should be just long enough to pass under the edge of range boiler-

stand; the next piece should be of $\frac{3}{4}$ -inch pipe from the elbow to just beyond the outside edge of the boiler and screw on one piece of a union that gives you a positive end. The next move should be to screw a 1-inch short nipple with 1-inch x $\frac{3}{4}$ -inch reducing elbow with the side of the boiler the elbow looking down. Then determine the length of nipples required in the water front. In some cases one nipple requires to be longer than the other, but always try to have the centres of the elbows the same distance from the wall as the elbows in the boiler. Of course, the elbows in the water front are often closer to the wall than those in the boiler, in which case turn the elbow at the side of the boiler at an angle towards the wall and the one in the bottom of boiler towards the wall, then use a piece of bent pipe or an angle elbow at bottom so as to dispense with 90-degree elbows where possible. One thing also to bear in mind is to use as few fittings as possible, especially 90-degree elbows. Having got these measurements, proceed by placing another piece of pipe in the elbow at the side of boiler which should be measured end-to-centre of an elbow, this elbow to be in line with the elbow which leaves the water front top outlet. Then take a short nipple and screw one side of a union on, to complete the top connection and take next measurement from end to face of union. The fitter must use his own judgment when allowing for threads; he is the best judge because he knows best what kind of threads his dies cut. The bottom connection requires the same method. It is always good practice to place the draw off bibb cock in a convenient position so that it can be used often, and to place the unions in a handy position. As regards the kind of unions to use the very best are none too good. They should be of a kind which requires no washers. We spoke of placing the bibb cock in a handy place, this cock is often placed where a pail cannot be got near it and hence never used, or if perchance the tap does get turned on after not being used for some time it begins to leak.

It would be well for the fitter to make a point of explaining that this tap should be used often, in order to keep the tap in order, and to keep down the rust which accumulates in the pipes and bottom of boiler.

Should Main Sewers Be Ventilated; How?

Showing That if the Main House Trap Were Eliminated, Sewers as Well as House Drains Would be Better Ventilated Than When Main House Traps Are Used.

THE city of Toronto has lost one of its resident engineers, Robert G. Strathearn, through gas poisoning while inspecting a main trunk sewer on Argyle street. The cause of the fatality, we are told, was that a gas main had been broken in some way and filled the sewer with coal gas. This accident may have been even more serious but for the aid of a young engineer by the name of M. E. McDonald, who went into the sewer and rescued two men named Seaton and Million, who were overcome with gas.

It, however, transpires that this sewer is really not connected as yet to the sewerage system, and is only as it were under construction, but even when completed will not be ventilated.

There are quite a number of cities in Canada which do not provide ventilation for main or even any sewers, and as far as can be learned for no reason except that the engineers never provide for ventilation at all.

Then came the question as to how these main sewers could be ventilated.

Well, there are scores of ways which would be more or less expensive, but there is one way which would in actual fact be cheaper than not ventilating them; by simply eliminating the main house trap. Here in the city of Toronto the plumbing by-law required a main house trap and breather on each house drain and what is the result? Caps become loose and lost, children play around the openings, which have to be projecting "not less than 12 inches above the finished grade."

Now this breather question is one and the same as the main house trap question. No doubt if the latter were used the former should be also, though where every trap or fixture is back-vented the breather is not necessary. The breather acts as a vent to the house drain when a fixture is flushed, because, if the trap were inserted without the breather, a back pressure would be set up when the w.c.'s are flushed, and as is well known under present conditions the trap shuts off any sewer ventilation which would be all that is necessary to efficiently ventilate the main sewer. Such a fatality as has recently happened is just as likely to happen in any main sewer which is not ventilated, therefore, it is dangerous. Such a matter as constructing large sewers without providing proper ventilation is one which should receive some attention, and it is up to sanitary engineers to take action, and not squabble

and quibble over old methods and practices such as the main house trap question, when every one admits that dispensing with it would adequately ventilate the main sewers.

Almost every city which clings to old practices, using tile drains within the walls of a building, installing main house traps and breathers, and back-venting every fixture irrespective of condition or location, will be generally found behind the times on other matters. We hope in the near future to see more interest taken in these matters and just as soon as there is, just so soon will greater strides become the order of the day.

No other calling is as responsible to humanity for its conduct as sanitary and heating engineering, and no other craftsman can make himself as indispensable as the sanitary engineer. Therefore let us see to it, that we take up a few of the questions mentioned from time to time in Sanitary Engineer, all which will reflect great credit to the craft.

No doubt some of our readers will object to the main house trap being left out from the main house drain, but we venture to state that 90 per cent. who object are men who on the whole are the least progressive on other lines in sanitary engineering. What is wanted of sanitary engineers is that we get right down to "hard pan," quit deceiving ourselves in this matter, and in that way find out for ourselves which is right—the trap and breather or no trap and breather. There may be certain conditions when a trap and breather are necessary, but it is for sanitary engineers to devote more study to the science of sanitation, so as to know how, when, and where traps and breathers should be installed. As we have often stated in the Sanitary Engineer, the wholesale venting, back-venting, the installing of traps and breathers is no doubt being overdone, and such work costs too much money.

This is, or should be, an age of conservation—conservation of time, energy, material, etc.—and such being the case, sanitary engineers should join in the movement of conservation. For instance, some city plumbing by-laws demand that where lavatories are in battery, no more than two fixtures shall be attached to one trap. When in case there are only three lavatories, two traps would be required. Now, in such a case, if the center lavatory is trapped and vented, it would be all that's necessary, and in that way

conserve one trap, vent, time, labor, etc., and the same when speaking of ventilation of main sewers. Just imagine, by cutting out the cost of a trap and breather on each house drain, our city sewers can be properly and most economically ventilated. The city of Ottawa does not believe in main house traps; the city of Fort William does not require them, and until recently the city of Winnipeg did not demand main house traps. All these three cities have live thinking men as plumbing inspectors, men who have a say in the construction of sanitary engineering in their cities.

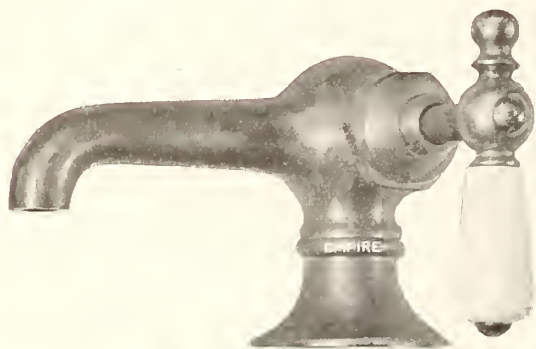
The city of Winnipeg found it necessary for the present to instal the main house traps, so as to prevent the branches as they entered the main sewers from freezing; but neither Toronto, Ottawa, or Fort William have been troubled in that way, and we feel sure that Winnipeg will ere long dispense with the main house trap. James Smith, the chief plumbing inspector, stated, when asked his opinion as to whether the main house trap should be inserted, "that it was an abomination, but at present they were left no choice but to use it on account of their climatic condition." Sanitary Engineer, knowing the feeling as expressed by Mr. Smith, that the main house trap is an abomination, feels sure that Winnipeg will not be long before her sanitary engineers will grapple with this matter, and in the end find out a cure for their trouble other than using the main house trap, and in that way assure perfect and natural ventilation for her main sewers.



SALES PERSONALITY.

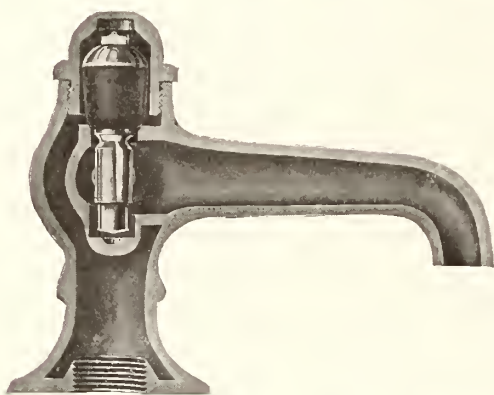
There is fully as much goods sold on the strength of an attractive personality as on the quality or the price of the articles offered. What causes the customer to buy gasoline when he does not require it, simply because the salesman has said, "Gasoline is going up according to our reports?" The answer is that the customer has confidence in the intelligence and honesty of that clerk. Why do women seek out Mr. Baird in preference to Mr. Masses as the man to wait on them? Because the former is courteous, cheerful and attentive to their wants—in fact has personality. Masses may be a wizard on hardware, but a machine-like automaton cannot sell goods against the live wire, even though he may be the best posted man of the two.

3 New Basin Cocks



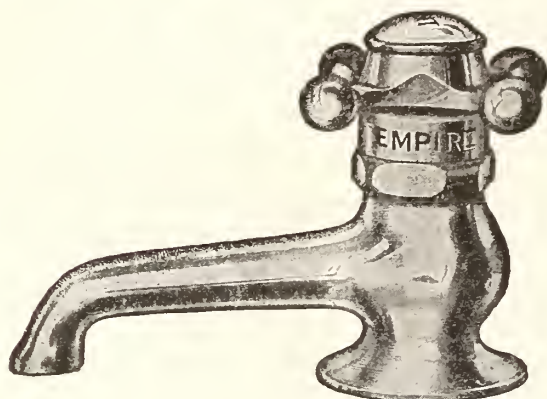
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Our roller-bearing, self-closing banner cock, equipped with two sets of ball bearings, the best phosphor bronze spring, and the most durable hard rubber seats.

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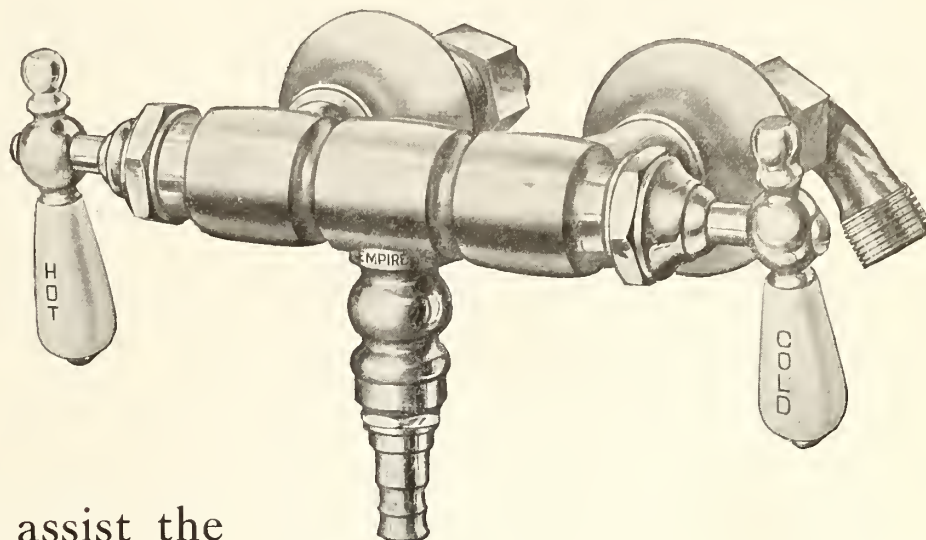
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PLUMBERS' AND STEAMFITTERS' SUPPLIES OF ALL KINDS

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Quick Compression Bath Cock

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It is our aim to assist the trade in every possible manner, and we are constantly devising new methods and articles to keep abreast with the progress of sanitary and heating engineering.

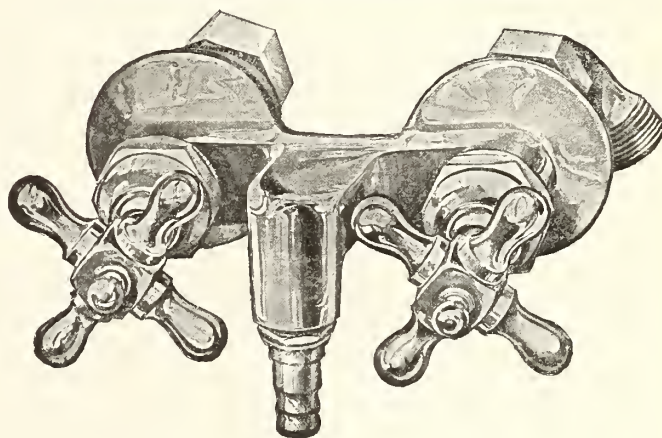
Suggestions we are glad to receive, whether for new designs and fittings or the improvements of existing ones.

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Midget Compression Bath Cock

Its design has beauty in every line and the best of metal is used in its manufacture.

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Plumber and Steamfitter of Canada

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TORONTO, JULY 15, 1914

DISCUSSIONS ON OVERHEAD EXPENSES.

IN this issue we have the pleasure of voicing a further discussion on overhead expenses. This feature of the sanitary and heating business is one which should certainly receive more attention than it does. The fact is very forcibly proven if we will look over the ratings given in Duns and Bradstreet. Just think of it, some of the finest men in the trade, men who have almost given their whole life to the betterment of the trade, being rated as only being worth a few hundred dollars. (Not thousands.) And why is this the case? Simply because they have paid more attention to the constructional part of their business than the financial. The other day the writer was given a case in point. On one of the main streets in one of the largest cities in Canada are situated the establishments of three sanitary and heating engineers, we will designate them as A, B, and C, a customer called upon A, B, and C, and asked the price of a cast iron enamel sink, (not roll-rimmed), size 18 x 24. A. offered one for \$3.50, B. for \$3.75, and C for \$4.00, the latter was asked if the \$4 included the installation, and when informed that the installing would be extra, the customer stated that this size sink, same quality and make could be bought for \$3.50.

We investigated this case and found such was a fact. Now can any of our readers prove what overhead expenses were figured in these three transactions. It is such methods which is the cause for small ratings in Duns and Bradstreet.



AS THE PUBLIC SEE US.

IN a future issue we are to give an article from the pen of a man who feels that the public have a load of grievances to voice, for the way they are treated by sanitary and heating engineers. We know this man is no crank, but a thinker, and what is more he is one of those men who never was known to question the charges made for work done, by any member of the craft. The writer can prove the statement, our reason for taking up this subject is, that those engaged in the business of sanitary and heating engineering will be able to see themselves through other eyes than their own, and as it were point out the defects of the other's viewpoint as well as remedy some of the faults in themselves.

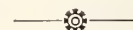


PRACTICAL INSPECTORS ONLY.

AT THIS period there are quite a large number of towns and cities who are beginning to see the need of an inspector of plumbing. They are preparing by-laws

in many cases after the fashion of other and older cities. They want some one to see these by-laws are being carried out. Such a method is like putting the cart before the horse.

What is wanted in the first place is the appointment of a practical sanitary and heating engineer, who has had years of experience and who has the cause of sanitation at heart. Then this man should be called upon to draft a set of by-laws suitable for the location and climatic conditions which prevail. He should be in every sense of the word, the town or city sanitary engineer, and should be a part and parcel of the board of health. It is a piece of folly to draft by-laws for one town or city from those of another, because of the fact that in 9 cases out of ten the latter's by-laws need revising in the worst way, because of their being so behind the times and obsolete. One of the reasons why so much work requires complete re-construction when alterations or additions require to be made, is, because no provisions are made in the first place in its construction, and a practical man if he is any good at all, generally looks ahead a little. Several towns and cities have adopted certain plumbing by-laws recently, and then appointed either the city engineer, the building inspector, or the electric wiring inspector, to act as plumbing inspector, simply with a view of economizing on salary, and, one of the worst features of this is, that plumbers do not object to such a course in many cases. Just imagine a sanitary engineer employing say 20 or 50 men and then appointing a foreman over these men, who knew nothing about sanitary and heating construction, what would happen? Yet the picture just drawn is exactly like a council or board of health appointing an electrician as plumbing inspector. The fact of the matter is, if the work done by sanitary and heating engineers is felt to be important enough to require the appointment of an inspector, that individual should be practical, he should not only be practical, but also be a man of clean character, and be imbued with the spirit of good citizenship, thereby being ever on the alert for progressive measures which will be of benefit to each and everyone of his fellow citizens.



EDUCATE THE PUBLIC.

A GREAT deal of time is spent by sanitary and heating engineers giving tenders on work they never get. This has been a sore point for years past, and unless something is done, the same condition is likely to prevail till the last trump is sounded. Now first of all this matter is simply a lack of education on the part of the public, or

those who ask this service of the trade, and if, the trade would take the matter up in that light they would soon be able to show the public the injustice of this method. For instance, let us take a man who employs say ten journeymen, and who's time is being taken up tendering on future work. What is happening at the various places where his ten men are working? We have an idea that some work is not being done right, and the public are in a way having to pay for it, but not getting quite as good a job as if the employer were oftener on the spot. We heard the other day of a sanitary and heating engineer who very seldom fails to satisfy his customer. How it is done? our readers may ask. Well this man never renders an account until the job has been inspected by himself, and his men know that, and take good care that the job is left O.K. This man very seldom "figures" on a job now, he finds that by having taken such a course, his customers have become educated to the fact that he (the sanitary engineer) takes an interest in the work his men are doing. This sanitary engineer started out first doing nothing but jobbing, and now he gets most of the larger jobs though he never gives in a tender. He has given the public a square deal and is being paid for his time. This man has taken time to educate the public and has no doubt succeeded. When asked how he got around the architects' red tape, he stated that when a customer wanted him to do any sanitary and heating engineering, he (the customer) generally instructed the architect who was to do the work and no question of price came up till the job was done. This sanitary engineer is not a gambler, and every one who juggles with tenders is nothing more than a gambler. They gamble with their own money and other folks' material and the public get, in 90 cases out of 100 the time and material at about 60 cents on the dollar. Duns and Bradstreet prove the statement and we maintain that to-day there are not more than 10 per cent. in the business who have been just to themselves.



INCREASE THE SALE OF LAUNDRY TUBS.

ALTHOUGH there are quite a large number of laundry tubs being sold and installed, this field could be worked far more were it not for the cost of installation, particularly in homes already built, because of the fact that most laundry tubs are placed in the basement and are therefore the lowest fixture. Then there is necessity for back-venting when this fixture is connected to the house drain or waste piping.

Now almost every basement has a floor drain trap, and oftener than not the seals of these traps are broken by the water evaporating and in summer time particularly there is no water run on the floor, thus a great danger of sewer gas entering the house is created.

The same argument can be put forth when a laundry tub is connected to the drainage system because, very

seldom are laundry tubs used more than once a week and the traps are very often not larger than 1½ inch in size, one trap being used for a double tub, and long before a week has transpired the water in the trap has evaporated thereby making a gutter in the basement floor which would carry the waste water to the basement floor drain trap, the seal in the latter trap would be preserved, and the non trapping of laundry tubs would eliminate the danger of sewer air entering the house, also create a greater sale of laundry tubs, which no doubt should be in every home whereas less than 10 per cent. of the houses contain such a fixture.



THE BUSINESS SITUATION.

THE one outstanding conclusion from the many that have been drawn relative to the unfortunate industrial situation in which the Dominion finds herself to-day is that during the past five years we have been hitting a too rapid pace.

With a monotonous regularity and intonation, bank, association and company annual meetings have been told that we are going ahead much too fast for our resources, and that the present condition of affairs is none other than the reckoning time for our indiscretions. One of the most interesting features in all of this out-pouring is that expressed by the little but all-embracing pronoun, **we**. It reminds us of a number of apprenticeship experiences in which, when some achievement was accomplished, the foreman declared himself alone personally worthy of the honor, but if error, followed by trouble, happened to be the outcome, then **we** brought it about, and not he; oh no.

To our mind there is too much generalisation as to the cause and responsibility for the existing depression in our midst, and too little tendency to apportion or even appropriate the blame. It is neither a question of democracy nor aristocracy, but it is an attitude of our financial and business magnates which has been proven to be altogether wrong. In certain departments and spheres of activity the most highly developed and concentrated efforts are being made to secure efficiency, but who shall say that our national purse strings have been adjusted to maintain the proper balance between our resources development and the capital outlay.

Our citizens for the most part are blissfully unconcerned as to the "why and wherefore" of this depression period, their principal questionings being relative to its passing, and most of them, particularly those who have passed through similar periods, have come to look on each recurring occasion with more or less resignation. However any of us may view the present business situation, complacently or ready to blame, there is little likelihood of anything miraculous being seen in the display of caution when the next boom begins; rather is there to be feared a repetition, on an even more advanced scale, of reckless optimism. History generally repeats itself.

ENTHUSIASM

Enthusiasm is the greatest business asset in the world. It beats money and power and influence. Single-handed, the enthusiast convinces and dominates where the wealth accumulated by a small army of workers would scarcely raise a tremor of interest. Enthusiasm tramples over prejudice and opposition, spurns inaction, storms the citadel of its object and, like an avalanche, overwhelms and engulfs all obstacles. Faith and initiative rightly combined remove mountainous barriers and achieve the unheard of and miraculous. Set the germ of enthusiasm afloat in your plant, in your office or on your farm; carry it in your attitude and manner; it spreads like contagion and influences every fiber of your industry before you realize it; it begets and inspires effects you did not dream of; it means increase in production and decrease in costs; it means joy and pleasure and satisfaction to your workers; it means life, real and virile; it means spontaneous bedrock results—the vital thing that pay dividends.

The Postmaster General versus the Merchant

A Complete Review of the Events Following an Attempt by Hon. L. P. Pelletier, Postmaster-General, to Secure Power Over the Press of Canada and Thus to Discriminate in Favor of the Big Papers Which Circulate Mail Order Advertising.

A BILL to amend the Post Office Act of Canada was introduced into the House of Commons by the Postmaster-General, Hon. L. P. Pelletier, during the session of Parliament recently closed. After certain amendments had been proposed and the bill had been passed back and forth between Commons and Senate, it was found that a satisfactory agreement could not be reached and the bill was not passed. The Postmaster-General has since, in a statement sent broadcast throughout the Dominion, made the charge that his bill was killed by the Liberal majority in the Senate, laying stress on the fact that thereby some 1,400 postal employees are deprived of an increase of salary provided for in one clause of the bill.

Under the circumstances it is felt necessary that a full explanation should be given to the public, not only in regard to the terms of the proposed legislation, but also with reference to the manner in which it was introduced. The explanation will serve to make clear the attitude of the press of Canada in opposing the bill, and, if it bears hard on the Postmaster-General, it must be borne in mind that he has forced the press into a defensive attitude. The question has never been a political one in any sense of the word—which is attested by the fact that the publishers of Canada, Conservative and Liberal alike, have opposed the measure—and it is largely to remove the impression that it is a political issue that this explanation is made. It is felt also that the public, being directly interested, should be fully informed in the matter. If legislation detrimental to the publishing business were put into force, the public would suffer either through a curtailment of service rendered by newspapers and periodicals or the other alternative of higher subscription and advertising rates.

A Plea For Higher Rates.

In order to give a clear understanding of the case, it will be necessary to review the matter from the very beginning. During the administration of Sir John A. Macdonald, newspapers and periodicals were carried in the mails free in recognition of the educational and national work they were doing. As the expense of distribution grew, however, the Post Office Department felt that this privilege could no longer be extended, and during the tenure of office of Sir William Mulock rates were fixed of 1/4 cent and

1/2 cent a pound on all second-class matter. Later the Senate reduced this to 1/4 cent all round. It was recognized that this change would completely upset the plans on which publishers had been basing their operations, and accordingly some papers were allowed five years in which to adjust themselves to the new conditions.

Nearly two years ago the Postmaster-General, Hon. Mr. Pelletier, notified the Canadian Press Association (which includes in its membership a very large majority of the publishers of Canada) that a higher rate of postage would be necessary on second-class matter. The publishers promptly informed him that, if it were found that conditions warranted it, they would cheerfully comply with whatever Parliament in its wisdom and after careful investigation found was right. In order to secure information on the relation of the increased cost of mail service to the carrying of second-class matter, the publishers employed M. E. Nichols, then the editor of a Winnipeg Conservative daily, to prepare a report for them. This report was submitted at a special joint meeting of the Canadian Press Association and Canadian Press Ltd., held in Toronto on November 20, 1913. In it Mr. Nichols dealt with the congestion in the mail service. He went further and appended a series of recommendations as to new rates and regulations which the Canadian Press Association should, in his opinion, suggest to the department. After some discussion, the Canadian Press Association accepted some of his recommendations, amended others and struck out others altogether, agreeing on the whole to an arrangement that would mean a very considerable increase in rates. The report as thus amended was submitted to Mr. Pelletier at once by Hal. B. Donly, president of the Canadian Press Association, and J. F. MacKay, president of Canadian Press Ltd. It is reported that Mr. Pelletier expressed the opinion that the suggested arrangement was generally quite satisfactory, but that there were some features included in the original report which he wanted re-inserted. As the original report had been a strictly confidential one, the question may be asked how information as to its contents had become known to the postal authorities. Finally, the Postmaster-General stated that the recommendations would be con-

sidered and the views of the department submitted in a short time, when, he urged, another meeting of the Press Association should be called at once to consider his proposition.

The promised memorandum was never supplied although the Association made repeated requests for the information.

Before going any further it will be necessary to show what excuse Mr. Pelletier had for not fulfilling his promise. The Canadian Press Association heard nothing from him until it was discovered that on May 4 bill No. 147 had passed the House of Commons containing a clause which took the fixing of postal rates on second-class matter out of the hands of Parliament and vested it in the person of the Postmaster-General. Prompt steps were taken to oppose the measure in the Senate—the only recourse left—and in the course of the fight which ensued a deputation waited upon the Premier, R. L. Borden and the Postmaster-General to protest. Mr. Pelletier defended his action in bringing the bill forward before carrying out his promise to submit a proposition to the Canadian Press Association by stating that, at the conference with the two presidents, they had agreed to have M. E. Nichols prepare a supplementary report for him, and that as a result of the non-receipt of this report he had not been able to submit the promised memorandum. In reply, President Donly expressed his clear understanding that neither he nor the president of Canadian Press Ltd. had agreed to have Mr. Nichols, who was present, prepare a supplementary report. He remembered that during the interview the Postmaster-General had asked Mr. Nichols to secure some information regarding the custom in certain countries of grading newspaper rates according to the proportion of advertising to reading matter. This request was preferred by the Postmaster-General himself in quite an incidental manner, and it was clearly the understanding of the two presidents that this report had nothing whatever to do with the arrangement that the department was to submit an early memorandum to the Canadian Press Association covering the official proposals. **That the supplementary report was to be prepared for the Post Office Department has since been confirmed by Mr. Nichols himself.**

Clearly, therefore, in failing to keep to his arrangement with the Canadian

Press Association and in seeking to put through legislation which would give him the whip hand over the publishers before submitting his proposals to them, the Postmaster-General was not playing fair.

The Introduction of the Bill.

This charge of unfairness will seem mild when the circumstances surrounding the introduction of Bill No. 147 are reviewed. The newspaper parliamentary reports of May 5 contained an item to the effect that on the preceding day a bill to amend the Post Office Act had been given its third reading and passed in the House of Commons. That was all that was said. No references were to be found as to the nature of the amendments. But when the Hansard reports came to hand it was found that Bill No. 147 contained a clause which took out of the hands of Parliament the right to fix the rates on second-class matter and transferred that power to the Postmaster-General. No notices had been sent out of this bill. The members themselves were ignorant of what it was for. When the House went into committee on the third reading, Hon. Mr. Graham asked the Postmaster-General what changes were to be effected, receiving the following reply:—

“The main object of the first change—that is, in paragraph E—is to make it clear that the right of looking at newspapers, parcels, and so on, is absolutely confined to those, and that there is no right to open letters. The section as it stands at present, as my hon. friend from Rouville (Mr. Lemieux) knows, leaves the question open as to whether or not it is right to open letters. I want to make it clear that the right does not exist. We are amending the clause so that there is no possibility of doubt, by inserting the words, ‘except in the case of letters.’ There are other matters of detail, but this is the main object of the clause.”

Now let us see exactly how clause E reads:

(E) “Established the rates on postage on all mailable matter, not being letters, and prescribe the terms and conditions on which all mailable matter shall, in each case or class of cases, be permitted to pass by post; and, except in the case of letters, authorize the opening thereof for the purpose of ascertaining whether such conditions have been complied with.”

It will be noted that the “main object of the clause” is added at the bottom, while the “other matters of detail” include the right to arbitrarily fix rates on second-class matter in each case or class of cases. A mere “matter of detail,” this power vested in the hands of one man which would enable him to fix, if he so desired, prohibitive rates, to put any or all classes of publications out of business!

Mr. Pelletier’s misleading explanation of this clause in the House can be accep-

ted as proof of either one of two things.

First, he did not himself realize the importance of the first part of the clause.

Second, he was deliberately endeavoring to deceive the members and rush the bill through before its real importance became known.

The first explanation is not tenable. Mr. Pelletier is an able man, a man of broad experience and considerable astuteness. No one would insult his intelligence by assuming that he really believed that the question of taking from Parliament a power which had been vested there since Confederation, a power which might involve millions of dollars, was a mere “matter of detail”—an item of minor importance as compared with the rest of the clause which fixes that the Postmaster-General can open newspapers but not letters! It is not to be thought for a moment, we repeat, that the head of the most important administrative department could be deluded into actually believing anything of the kind.

But, further, if the right he was thus prepared to assume of fixing second-class postal rates was a mere “matter of detail,” why did he hold up the whole bill when he found that this one “matter of detail” was not acceptable? The bill also provided increases for some 1,400 employees of the department, who are badly in need of the raise, he says. If a little “matter of detail” could not be adjusted, why did he not accept the amendments and let the bill go through this session? The “matter of detail” could be fixed to his satisfaction at the next session and, not being of sufficient importance to be worth explaining even to the members of the House, it could not matter much either one way or the other.

No. The Postmaster-General’s subsequent course bears convincing testimony to the fact that this mere “matter of detail” was to him the most important part of the whole bill. Why, otherwise, should he permit his whole bill to be shelved because of it?

If further proof of the purpose of the astute Postmaster-General is required, the following facts will serve to establish the contention that he deliberately attempted to rush the bill through before interested parties would have a chance to stop it.

When it was learned through the Hansard reports that this bill had been passed in the Commons, the secretary of the Canadian Press Association sent a request to the Post Office Department for a copy. The reply received from Dr. Coulter, Deputy Minister, was dated May 8 (the bill passed May 4) and read in part:

“With reference to your letter of the 6th inst. asking for copy of the Postmaster-General’s Bill to amend the Post

Office Act which passed its third reading in the House of Commons the other day, permit me to say that none of these will be printed until the bill has been signed by the Governor-General, and when this has been done, I will be pleased to immediately send you a copy.”

Yet the fact remains that hundreds of copies of the bill had been printed.

The secretary of the Canadian Press Association received copies of the bill from another source, the day before he received this letter from Dr. Coulter in which the latter states that the bills were not yet printed!

Why had not a copy been sent to the Canadian Press Association? Surely the interest of newspaper publishers in the proposed change was sufficiently great to entitle them to a copy of the bill pending! Why was the request for a copy refused?

Why Fight Was Carried to Senate.

If the purport of the bill had not been discovered, almost by an accident, the measure might have passed through the Senate in the same quiet way that it slipped through the Commons, before the publishers received copies of the bill. They would not have learned of the new power acquired by the Postmaster-General until it was too late to even protest. Can it be that this contingency had been foreseen, had in fact been counted upon?

Mr. Pelletier at various stages of the fight complained of what he termed the unfairness of publishers in carrying the fight before the Senate, a body politically opposed to the Government and himself. By skilful manipulation of this complaint he has endeavored to create a political issue out of it and to make it appear that his bill was thrown back through the caprice of a hostile second chamber instead of as a result of the opposition of a united press.

As a matter of fact, the bill had passed the House of Commons before the publishers knew that such a piece of legislation was even contemplated. What course was left but to fight it in the Senate in sheer self-defence?

The publishers of Canada would have much preferred to have fought the bill on the floor of the House, where the question could have been thrashed out without any suggestion of partyism creeping in. Mr. Pelletier was afraid to have the bill discussed in the House. He has openly avowed his fear. If he felt that his measure would be beaten in the Commons, where any party bias would be in his own favor, why does he charge that its practical defeat in the Senate was due solely to political animosity?

As a matter of fact, the press has presented a united front on this question. P. D. Ross, editor of the Ottawa Journal, who led the fight for the Canadian Press Association, is perhaps the foremost

newspaper supporter of the Government and who because of this very justly commands the respect and confidence of the Prime Minister, more perhaps than any journalist in Canada. Many of the publishers who went to Ottawa to protest were strong Conservatives. Opposition in the Senate did not come from the Liberal side of the House alone.

What is more, if the issue is reviewed next session, the publishers of Canada will go before the House of Commons to present their case, and if Mr. Pelletier relies upon carrying his point by appealing to sheer party loyalty, he will undoubtedly meet a series of surprises.

The amendments proposed in the Senate, which Mr. Pelletier refused to accept, were framed with an earnest desire to make the bill workable in the interests of both departments and press. It is not stretching a point to assert that the objections raised by the Senators were precisely what Mr. Pelletier would have encountered in the House had the members been aware of the purport of the bill when it was first introduced.

Objection Based on Principle.

The publishers of Canada objected to the bill purely on principle. It is contrary to the spirit of the British constitution for arbitrary powers to be vested in one man, without the right of appeal to Parliament. What sane man would suggest that the fixing of the tariff should be placed in the hands of one member of the Cabinet? In a lesser degree this is exactly what was contemplated in the postal amendment. It would rest with the Postmaster-General to say what rate must be paid on the printed matter circulated throughout the Dominion.

The danger would be two-fold. Not only could an unscrupulous official unfairly penalize any paper or class of paper, and discriminate against papers for party purposes, but the man responsible for the fixing of the rates would himself be placed in an invidious position. He alone would have to bear the brunt of discussion and criticism. On that man alone would all the influence of competing interests be brought to bear. Would it be wise to place such power in the hands of one man?

A significant admission was made by Mr. Pelletier before the Senate committee when the matter was first discussed. He had pointed out that the new rates suggested by the Canadian Press Association bore heavily on the metropolitan daily newspapers. "I cannot fight these big papers," he declared. If he feels unable to withstand the influence and power of the metropolitan dailies when the question rests with Parliament, would he not have been even more impotent if the sole responsibility of fixing

the rates had been placed in his hands, thus making him the target against which such influence would be directed? In view of this admission, what could the smaller paper, whose interests are almost diametrically opposed to that of the big "dollar daily," expect if the adjustment of rates rested with one man—and that man professedly afraid of the big fellows in the publishing world?

But it is not necessary to go on conjecture alone in considering the effects that the measure would have. At the same session of the Senate committee Mr. Pelletier declared that the publishers need not anticipate any arbitrary use of the power he was seeking to get into his hands. Colonel MacLean, publisher of class papers with a combined circulation of over 100,000, including Printer and Publisher, the organ of the publishing industry, spoke before the meeting, objecting strongly to the proposal. In the course of the discussion that ensued, the Postmaster-General, forgetting his pledge that the power would not be used in an arbitrary way, stated that, if Colonel MacLean would not consent to the proposals, he would impose a rate of 8 cents a pound on class publications.

What more telling proof could have been adduced of the use that might be made of the arbitrary power that the Postmaster-General sought?

A rate of 8 cents a pound would put every magazine, trade, technical, and farm paper in Canada out of business. Thus would one man have the power to cripple, kill or, on the other hand, to unfairly foster by privilege any particular paper or class of papers.

The Status of the Class Press.

One of the main points of contention since the question of increasing the postal rates first came up has been the status of the class press. Despite the fact that trade and technical papers have become a necessity in every line of industry, despite their acknowledged worth as an educational factor, despite finally, the fact that the governments of Canada spend large sums of money annually to send out free printed matter of an instructive nature to the farming community, thereby performing the same work for the farmer that the trade paper does for the engineer, the mechanic and the merchant; despite this, there has long been a prejudice in the Post Office Department against trade and technical papers, a prejudice which has manifested itself in close surveillance, dogmatic interpretation of statutory details and open threats of a higher rate than is placed upon daily newspapers. As soon as it was announced that postal rates would be advanced, it became known that it was intended to seize the opportunity to penalize the trade press. The report submitted by the daily newspaper-

man, commissioned to report on postal matter, contained recommendations to that effect—recommendations bolstered up with reasons couched in terms so concisely the same as employed by the postal officials that one trade publisher was impelled to exclaim: "It's the hand of Esau, but the voice of Jacob."

The Canadian Press Association, with loyal appreciation of the real value and the just claims of the trade press, refused to countenance the suggestion that the newspapers escape their due share of the advanced cost of postal transportation by putting a larger load on the trade press, voting with practical unanimity to throw out the resolution.

It was not the intention of the writer to enter into a discussion of the position of the trade press at this time, but the above explanation was necessary in order to show the next inconsistency into which the worthy Postmaster-General strayed. At the meeting of the Senate Committee already referred to, Mr. Pelletier stated, in replying to Colonel MacLean, that in the course of the interview he had had with the presidents of the Canadian Press Association and Canadian Press Ltd., when they laid before him the report as adopted in November, he was told by these gentlemen that it was the spirit of the meeting of the Canadian Press Association and Canadian Press Ltd. that a higher rate should be placed on the trade press. As the instructions of the two presidents had been to merely wait upon the Postmaster-General and lay before him the findings of the meeting, it was inconceivable that they could have made such a statement. **Printer and Publisher** at once communicated with both Mr. Donly and Mr. MacKay and received their unreserved and emphatic denial of the statements imputed to them by the Postmaster-General.

The Position of the Postmaster-General.

Throughout the whole course of the fight, the representatives of the press made it their earnest endeavor to keep the personal element in the background. It was made very clear that their objection was not to Mr. Pelletier having the power he sought, but to **any** man having that power; that it was too dangerous a power for one man to have from the standpoint of the good of the country as well as the good of the press. But as the matter progressed and the part that Mr. Pelletier was playing became more transparent with each move that he made, the conviction was driven home that it would be a particularly dangerous policy for such a man as Mr. Pelletier to exercise. He convicted himself of inability to exercise that power with absolute fairness to all concerned by his own

statements in the course of the debates. On several occasions he voiced the opinion that he could not antagonize the powerful metropolitan newspapers. At the meeting of the Senate Committee on Banking and Commerce, on May 29, he said: "But I cannot afford to have all the papers in this country banded against me." If one proceeds to analyze this statement, it becomes apparent that the man who made it is not a proper person to hold a power which would enable him to summarily penalize the press and, moreover, would put him in the position of having the influence of all sections of the press focused upon him. Let us proceed upon a supposition. If he "cannot afford to have all the papers banded against him," he could not be expected to do what was right if the interests of the country at large should at any time demand that he take such action as would cause all papers to band against him. He has tacitly acknowledged that his fears would not permit him to exercise his power in a way that the interests of the country would demand. If he does not feel that he has the backbone to withstand any kind of influence which might be brought to bear, why does he endeavor to take a position where his lack of backbone might some time constitute a menace to the country at large?

The Postmaster General has wide powers now. It is part of his duty. He would have to decide, for instance, how far the metropolitan papers can go in dumping their products in all parts of the country at ridiculously low subscription prices, thus seriously jeopardizing the local press. The investigation made by Mr. Nichols showed conclusively that the congestion in the mails, which had created the necessity for higher rates, was chiefly around the big cities and was due to the enormous quantities sent out by the "dollar dailies." In recognition of this fact, the Canadian Press Association recommended that a minimum subscription price be set for daily newspapers with a view to preventing the "dumping" of big city dailies and thus reducing the congestion.

Before the Senate Committee on May 27 Mr. Pelletier said that "he was not prepared to put into effect the recommendation of the two associations in respect to a minimum subscription price for daily newspapers." Before the same committee on May 29 Mr. Pelletier said: "Fifteen days ago we took eight carloads of one paper in Montreal out to the coast, and they gave us \$84.50 as a revenue, though it cost us \$502.00." This instance shows that the Government loss is sustained through the circulations built up by the "dollar dailies" through their low outside prices. But Mr. Pelletier, calmly ac-

knowledging the truth of this, had nevertheless announced his intention not to apply the obvious remedy, preferring to make up the deficit by making all papers pay a higher rate, and specially penalizing trade and technical newspapers.

And that is exactly why one man should not be allowed to decide such big problems without any right of appeal beyond him. Individuals are too prone to errors of judgment. Mr. Pelletier's error of judgment in this matter is but a foretaste of what might happen if he were permitted to gather the reins of arbitrary power into his own hands.

The Progress of the Fight.

All that remains is to recount the events following on the fight in the Senate.

On June 2 the Senate Committee on Banking and Commerce passed the bill, with an amendment as follows: "Provided always that the maximum rate which the Postmaster-General may fix as the postage of newspapers and periodicals defined by section 53 of this act shall in no case exceed — cent for each pouch pound weight or fraction of a pound weight, however the rates may be graded according to distance and zones of transportation, and said rates so fixed and levied shall be submitted to Parliament at the ensuing session for revision or ratification."

As thus amended, the bill was passed by the Senate and sent back to the House. The executive committee for the Canadian Press Association were not satisfied, however, as it was felt that when the principle was wrong, the curtailment of powers as per the amendment would not suffice. A deputation, therefore, waited upon Hon. R. L. Borden and Hon. Mr. Pelletier, requesting that "(a) the clause of Bill No. 147 which amends present newspaper postage regulations be withdrawn for the present session, inasmuch as a delay of a few months in amending the present conditions which have existed for nearly 20 years can matter little. Or (b) that the schedule of rates suggested by the Canadian Press Association in December last be adopted until the Postmaster-General can submit revised rates next session."

A promise to consider the request was received from the Premier. In view of the promise of the Premier, it was deemed advisable to place the facts before a number of representative newspapers throughout Canada, in order that they might, if thought advisable, wire their views to the Premier and other members of the Government, and thus make it clear that the position taken by the Executive Committee of the Association was the position of the individual newspapers throughout Canada. To this end night lettergrams were sent on Wednesday evening to approximately 125

representative newspapers throughout Canada, and it is known to the officers of the Association that on Thursday a large proportion of these newspapers wired the Premier and other members of the Government, urging the principle that newspaper postage rates should be fixed by Parliament.

On the evening of Thursday, June 4, it was intimated to the Chairman of the Postal Committee that the Premier wished to discuss the matter further with him. Mr. Ross, chairman of the Postal Committee of the Canadian Press Association, had an audience with the Premier that evening, and Mr. Borden expressed the willingness of the Government to meet the views of the Association to the extent of having the rates fixed by the Treasury Board instead of by the Postmaster-General, with the provision that in no case should the rate exceed one and one-half cents per pound, and with the understanding that the Association would be consulted before the increase in rates now proposed was fixed by the Treasury Board.

After the interview with the Premier and again on the morning of Friday, June 5, Mr. Ross consulted the president and other members of the Executive Committee who were in Ottawa regarding the Premier's suggestion. All were agreed that it would be inadvisable to agree to the compromise suggestion, first because it was contrary to the principle that newspaper postage rates should be fixed by Parliament, and, second, because consent to the provision of a minimum rate of one and one-half cents per pound might be interpreted at a future time as an admission by the Association that the Post Office Department would be justified in imposing any rate of postage up to the rate specified as a maximum.

However, Mr. Pelletier introduced a resolution in the House of Commons making an amendment to the Senate amendment that the fixing of the rate be vested in the Treasury Board, the rates fixed to be put before Parliament for ratification or revision.

On June 10 the bill again came before the Senate and was passed with still a further amendment which practically re-established the old order, inasmuch as it provided that rates fixed by the Treasury Board should not come into force until revised or ratified by Parliament.

The bill as thus amended was returned to the House of Commons, and, on the motion of Mr. Pelletier, a message was ordered to be sent to the Senate that the House would agree to the amendment if it were again amended by striking out the words "and shall not take effect until so revised or ratified." Mr. Pelletier's contention was that these words would have the effect of preventing the

(Continued on page 34.)

Mechanical Drawing as Applied to Sanitary and Heating Engineers

A Series of Articles Showing in a Simple Way How This Line May be Mastered by Men of a Limited Education, and How Necessary Such a Branch is to the Craft.

AT the recent convention of the Ontario Society of Sanitary and Heating Engineers, several topics were taken up in what might be termed an unofficial manner, and one of these was the necessity of more time being devoted to the art of drawing one's own plans of a job before tendering on it, and thus being able to take off quantities of material required, this latter being necessary to enable any one to give an intelligent tender. Then again it was claimed by many that manufacturers were in the habit of making plans for installations and supplying them to men who had not sufficient education to do it themselves.

Much could be said about this phase of the question, but we do not feel we can remedy such a state of affairs by such a controversy except, that we are sure the manufacturers as a whole would be only too pleased to dispense with that branch of their business, providing the sanitary and heating engineers were more capable of doing such work themselves. We feel it is not a paying proposition for the manufacturer, nor is it one with which he should be burdened. The fact is, when this plan drawing began it was by way of giving assistance to the trade. It has, however, been, and is being, overdone. Therefore, in this series of articles we propose to show our readers who cannot as yet cope with this branch of their trade, how to develop their own plans. This will be done in as simple a manner as possible. In Figs. 1 and 2, we show the necessary equipment required. Fig 3, is a handy desk for workshop or office where room is limited. We do not, however, propose to enter into any geometrical problems in any way, but simply plan-drawing as applied to the trade. Neither do we propose to take up any particular system of heating and plumbing.

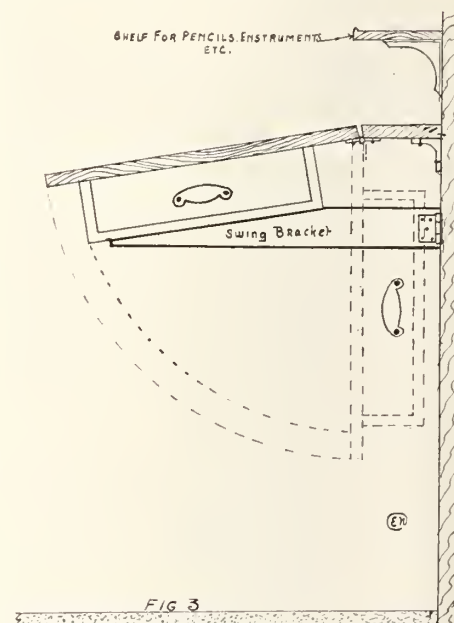
In our next issue we will take up a simple hot water heating plan with several ways of taking off risers and branches under various conditions.

One thing, however, we will endeavor to show, and that is the absolute need for each sanitary and heating engineer to study this branch, and in that way become actual master of the situation. As things are at present when a tender is accepted, or a job to be done, a large number of fittings and quantity of pipe is sent on to the job. Possibly a list is

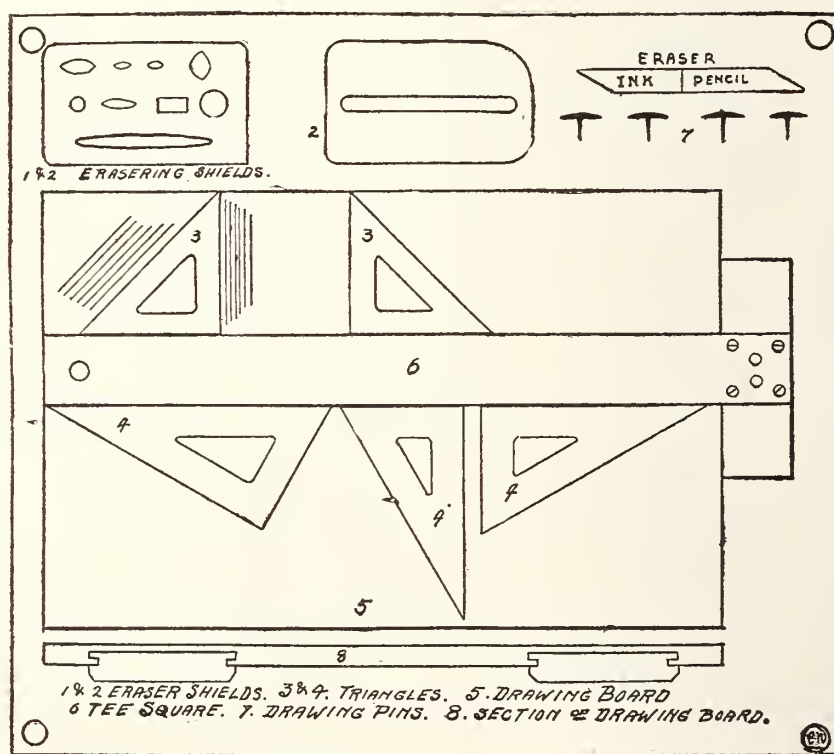
taken of such, which leaves the stock-room, and a list of the returns, but that is no guarantee that all the rest has actually been used on the job by any means. Thousands of fittings are wantonly wasted each year on new buildings by too many being sent to the job, and having them dumped into any convenient corner, to be covered with sand or lime, sawdust or shavings, according to the condition of the building. The writer was in a building the other day where from 35 to 50 dollars' worth of fittings were spread over an area of the floor measuring about 12 square feet. Why not have a large box fitted with a number of trays to hold the various sizes of fittings? Some time ago the writer was asked to check off a certain heating job for the sake of finding the actual number of fittings and feet of pipe actually installed, and found 10 per cent. more fittings charged up and 20 per cent. more piping. It was found that 15 per cent. of the pipe was accounted for by short ends, which was the result of pure carelessness in cutting, and the fittings had been either lost around the building or stolen. If a plan of each job was drawn, and that plan checked off for quantities, then about 5 per cent. extra allowed, and better care

taken of such material on the job, many a job would show a profit which often proves a loss.

In our next issue we will take up a simple hot water heating plan with several ways of taking off risers and branches under various conditions.



A handy desk for workshop.



"Shop Economics"—A Talk With Boss, Journeyman and Helper

Showing Where Savings Could be Made, Where the Boss Would Save, Journeyman Earn, and Helper Learn, by Adopting the Right Method at the Right Time.

IN the issue of Plumber and Steamfitter of May 15, 1910, there appeared an editorial entitled "Take Pains With Your Work." This the writer happened to see while looking over the files looking for a reference to the announcement of another item and strange to say, in going through an apartment house just the other day where some plumbing was being installed, the same thought came to one's mind, "Take pains with your work."

Here was an instance where the space allowed for the bathrooms was ridiculously small, and the "roughing-in" was on that account, no doubt, very difficult; yet what a lack of neatness. It is a scandal to see good material, beautiful fittings and supply pipes twisted and distorted in the way some are at present by poor workmen. Fig. 1 shows how a number of bath supplies and waste have been and are being installed at present in a large Canadian city.

If sanitary engineers are to make much advance in these days more neatness will have to be the rule. The writer was pained to see such work and the boss or foreman who will allow such work to pass deserves to be left severely alone. No doubt it was a case of cheapness getting the job, and no doubt this particular job was cheap, very; though in this instance it cost just as much time and material to install this outfit as to install a neat job. In fact more, because with a little care and a little foresight there would have been no necessity to bend to bath supplies in the least, thus saving so much time, as well as accomplishing a neat job. If there is any bending to be done, why not do it on the galvanized or lead piping which is concealed under the floors? There's no reason in the world why more neatness should not be the order of the day. In talking to one of our journeyman craftsmen on this very subject, he replied, "Oh yes, it's all very well for you editors to talk, but you don't know what it is to be in a tight corner; it's easy to make jobs to look neat on paper, but it's another thing when you're handling pipe." Well, such a statement made the writer wish he'd a pair of overalls on. The fact of the matter is, it is just the reverse. If it were a pure matter of choice with the writer, the "tight corner" would get the preference many a time. In another article

we advocate the necessity for more study in drawing plans of work to be installed, and the main reason is that the man installing such work, having first drawn a plan or sketch of his job, may know properly which would be the first and most efficient move to make. Then as regards "roughing in" measurements. These can all be obtained by writing to manufacturers of fixtures and fittings; therefore, why botch so much work? "Sanitary Engineer" would indorse a compulsory law enforcing all who install such work to attach a name plate to their work and in the event of downright poor work being proved, the one installing same should be called upon to put it right. Any law which would make sanitary engineers competent workmen would be a boon to not only the public, but also to the craft as a whole, for so long as poor work is permitted, so long will progress and efficiency in the craft be retarded.

"THE KNACK OF SELLING."

The System Magazine, Wabash Avenue and Madison Avenue, Chicago, have issued an excellent set of booklets on the topic of salesmanship under the title "The Knack of Selling." They summarize in a very attractive and inform-

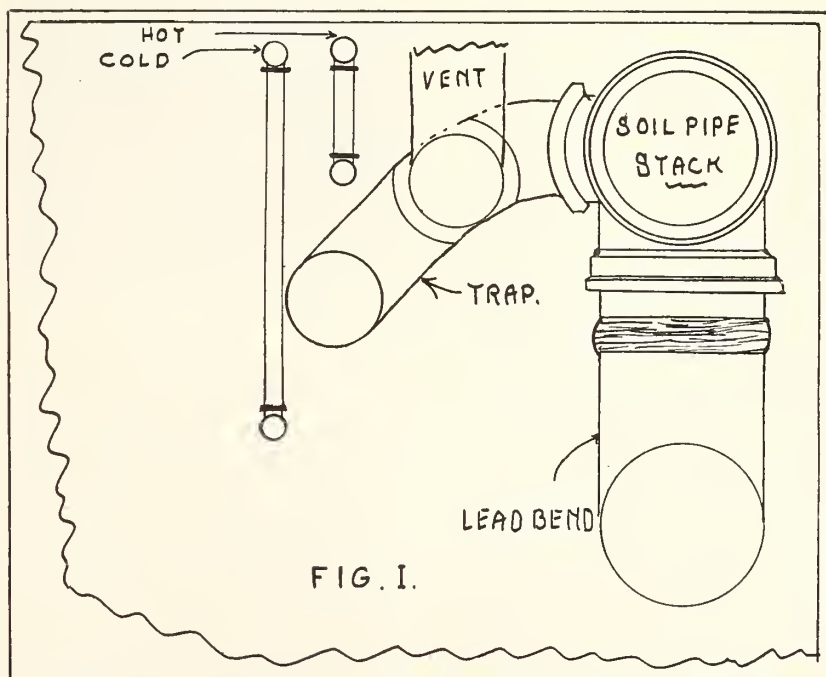
ing way some of the best principles of salesmanship. The books are entitled "Mapping Out the Canvass," "Managing the Interview," "How and When to Close," "Finding and Correcting Your Weak Points," "Getting In to See a Prospect," "Acquiring the Art of Mixing." The books are written in an attractive and readable style, while numerous illustrations from the experience of successful salesmen increase the value of the set. To many salesmen some of the individual suggestions will be easily worth the cost of the whole set of books, which is \$5. The books are convenient in size and shape to carry in the pocket for utilization in spare time.

METHODS OF SEWAGE DISPOSAL.

(Continued from page 15.)

Sewage disposal will eventually be found not such a costly item as is generally feared, if due consideration be given to actual requirements.

With regard to the question of nuisance from "disposal works," it may be taken and fully demonstrated by modern works at present installed in Canada that there is no odor or nuisance perceptible, and that the fear of nuisance is altogether based upon sentimental notions.



Showing how the "roughing-in" was installed for a bath.

The Supervision of Credit Accounts

Supervision of Credit Accounts More Important Than a Collection System—Suggestion for Collection Card System.

Sixth of a series by Wm. Cambell.

Continued from June 15 issue.

NO matter how tactful a merchant may be, he is bound to find difficulty when it becomes necessary to exert pressure on a slow-pay customer who thinks that he knows you well enough to be allowed to pay when he likes, unless you can make the transaction appear as a part of the store system over which you have no control. When a debtor of this class appeals to you personally—and when are you free from such appeals?—you are then in a position to say:

“Well, it’s this way, Mr. Smith, I’ve made my bookkeeper absolutely responsible for all accounts and under the circumstances I can’t in fairness to him interfere. You had better see him and give him as much as you can now and arrange for the balance.”

This cuts the ground from under his feet. The stand you have taken is a fair and logical one. He cannot appeal from it and neither can he take offence. The latter is an important point, while it is essential that the books should be kept clean, it is equally essential that the sanitary engineer should avoid trouble or unpleasantness with customers. An aggrieved individual, no matter whether he is in the wrong or not, can do a lot of harm to the reputation of a sanitary engineer.

Supervising Credits.

But if it is often advisable for a sanitary engineer to remain in the background in the matter of collections, he should always be very much in the forefront in the matter of the regulation of credits.

The supervision of credit is in reality more important than a collection system. A slow-pay customer cannot do you out of your money if he does not get on your books in the first place. From my experience I would strongly advise that, when an account is opened, the amount should be marked in the ledger which you consider this account should not be allowed to exceed. **And keep to it.** If this were done we would not find the books of so many merchants filled with accounts quite out of proportion to the means of the debtors. Bills have a truly astonishing rapidity for mounting up. When an account is started neither the seller nor the purchaser has any intention of allowing it to grow to large proportions; at

least the honest purchaser has no such intention. But as time goes on it creeps up until the total astonishes both the seller and the purchaser. When a debt reaches the stage where it is beyond the means of the purchaser to settle it within a reasonable time the work of clearing it off becomes a laborious one to the debtor and a decidedly aggravating and sometimes embarrassing process to the creditor. In many cases customers when their accounts become too big to pay will start going to other stores. They may not be intentionally dishonest, but merely passively lacking in moral ballast. They dread to face the merchant while the bill is still running, and thus, following the line of least resistance, transfer their custom to the opposition store.

Therefore, limit all accounts and put that limit when each account is opened. As stated before, **keep to that limit.**

Secondly, I would urge that a statement be rendered every week or month, and let it be early in the month. Good payers like to have their account rendered regularly. It is doubly necessary that accounts should be rendered regularly to slow-pay customers. This is the only way to keep them spurred up to the necessity of settling.

Thirdly, always give an invoice at the time of purchasing.

Collection Card System.

In handling accounts a collection card system is very necessary. Most well-managed stores have adopted this system, but there are still plenty of merchants who do not even know how collection cards should be handled. When an account becomes slow make out a collection card at once, putting down the name and address of the debtor, the date covering time of purchase, the balance of the account, and the date of last payment. A sample card to be used for the purpose is shown herewith. It will be noticed there is space on the card to record as well the date on which letters are written or calls made about the account. Space is also allowed to record the date of replies—if any.

All collection cards should be numbered. Thus, the first collection card will be No. 1, and the copies of all letters sent to this party will be marked No. 1, and filed in a docket or envelope, which will also be marked No. 1. The

replies received from the debtor all go in this envelope, and thus the complete correspondence referring to the account can be referred to instantly and without any trouble.

The next collection account will be No. 2, and so on.

These cards should be kept in a box or filing cabinet in alphabetical order. This puts the whole system on an efficient basis, reduces the work of getting out accounts, and of looking up matter referring to any particular account, to a minimum.

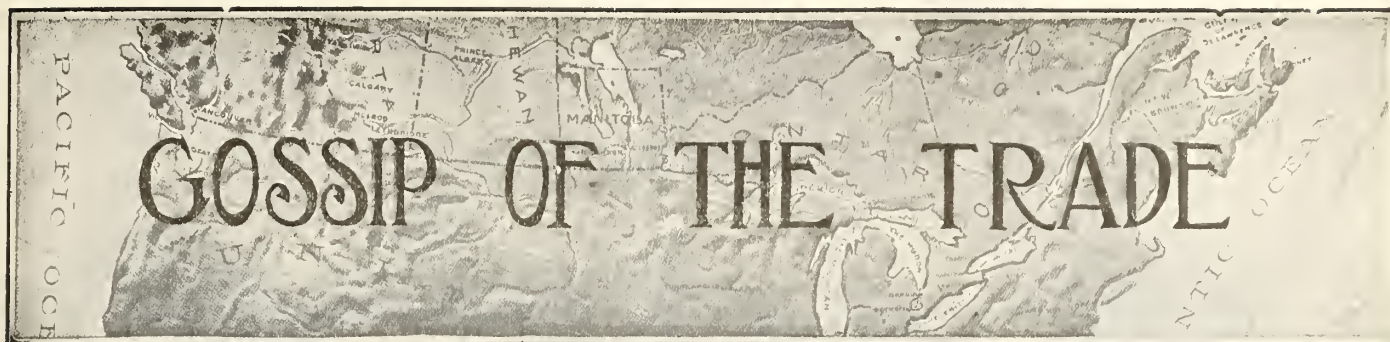
Write Off Bad Debts.

Many merchants make the mistake of allowing accounts to remain in their ledgers that they know to be bad and uncollectable. According to best book-keeping practice accounts should be written off directly they are known to be bad, or even if there is any doubt. In such cases it is best to write them off the books, and keep track of them on collection cards until every means of collection has been tried. In any case it is better not to keep in your books accounts which are not really a live asset. Otherwise you are only deceiving yourself into believing your business to be worth more than it actually is. Experience has shown that an account which has been allowed to run for some time, and to grow to large proportions, cannot safely be considered as a live asset, and to leave it on the books invites mistakes in estimating the worth of your assets.



BUYING.

The wise buyer is the man who not only studies his purchases and the need of his trade from every angle, but also studies his market. By keeping in close touch with his trade journal he can tell at a glance the trend of the times in any one article. Has the price been constant? Are conditions normal? If so, a large purchase may be advisable. Are reserve stocks in production centers low or otherwise? And how is demand? Any one of those factors may seriously affect the price of the article. The weekly market quotations give him an authoritative check of market conditions and keen trade reporters will notify him of spurious brands are being offered the trade. In short his trade journal is the buyer’s court of last resort.



Secures Civic Contract.

The city of Westmount, Que., has awarded contracts to the firm of John Watson & Co. for the erection of street lamp standards at a cost of \$2,100.

Severely Burned With Gasoline Torch.

Peter Graham, 654 Henri Julien avenue, Montreal, was very severely burned with a gasoline torch when it exploded. He was doing some work in a cellar in Point St. Charles when the accident happened.

A Communication to the Trade.

This is to advise you that we have transferred our main sales office from Port Hope to our Toronto show rooms, 119 King street east, opposite to St. James Cathedral.

In future, kindly address all sales inquiries and sales correspondence to main sales office, 119 King E., Toronto.

E. L. WAYMAN,
General Sales Manager.

A Creditable Move.

The Board of Control of the city of Montreal have under consideration plans for the establishment of a public lavatory on Victoria square. At the present time Montreal can boast of only one public lavatory, an underground station, which is located at Jacques Cartier square. There has been an agitation for some years to have other stations established, but thus far nothing has materialized.

Modern Heating for the Home.

"Modern Heating for the Home" is the title of a very interesting booklet now being issued by the Hutchison Vapor Heating Corporation, Herndon, Virginia, U.S.A.

This booklet is full of splendid information relating to the "Hutchison system," and should be in the possession of every sanitary and heating engineer, and can be procured free by writing to the following addresses: Hutchison Vapor Heating Corporation, National Bank Building, Herndon, Virginia, U.S.A., or Woodward Buildings, Washington, D.C.

Hercules Laundry Trays.

The Standard Ideal Co., Ltd., Port Hope, are issuing to the trade a splendidly gotten up bulletin describing a new line of laundry trays, to be known as the "Hercules" line. These trays are made up of special enamel, which will withstand the sudden expansion and contraction caused when hot and cold water is alternately allowed to run into the tray. Every sanitary engineer should and may procure one of these bulletins by writing to Sales Department, Standard Ideal Co., 119 King street east, Toronto.

Frankland at it Again.

The last time we had the pleasure of showing our readers two pictures of our friend Frankland, we had him indulging



in a ride in a barrow and partaking of — from a bottle, then on the water wagon, now we are asking our readers to note him in the water pipe, Frankland is strong on association work, but as far as we can learn is weak on anything stronger than water.

Those who have not met him are to be pitied as he is about the most congenial member of the craft we know.

Water Supplies Cut Off.

The city of Montreal is threatened with several damage suits in consequence

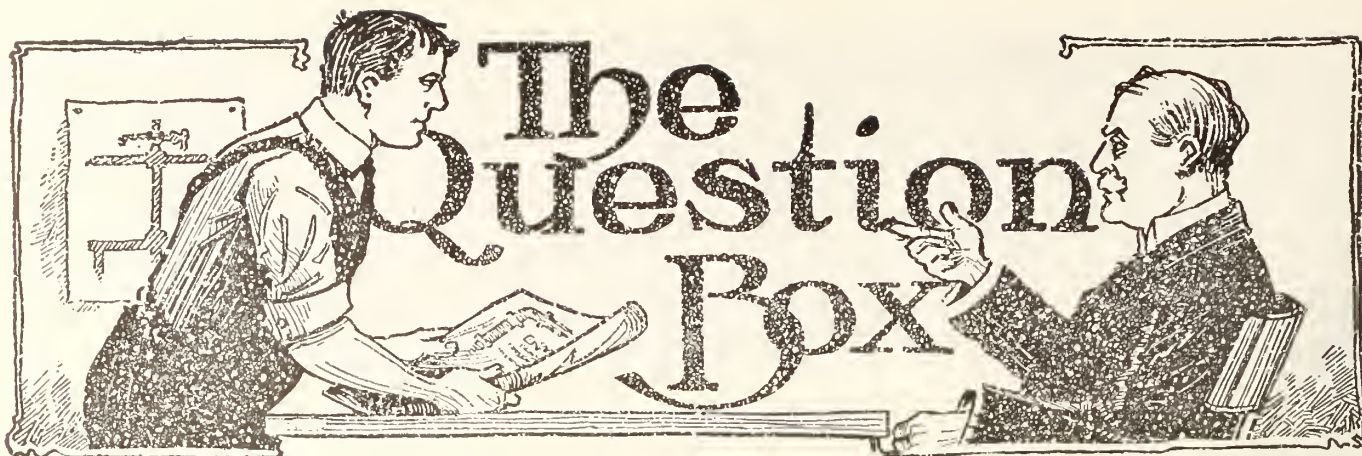
of some recent work in changing street levels and cutting off water supply to a number of families in Hochelaga Ward. Notices of five actions, totaling \$21,000, have already been served. It appears that city workmen, while engaged in street work, interfered with the water supply of some twenty families, and they were left without water for about a month. There is a great deal of dissatisfaction in Montreal over the manner in which the city is conducting its public works.

Plumbing to be Inspected in Woodstock.

Dr. Ruttan, M.O.H., Woodstock, brought up the question of plumbing inspection recently, defective plumbing, he thought, being the greatest cause of ill-health in any community. Yet no action had been taken to make inspection of all work done by plumbers. It was decided to appoint a committee, consisting of John A. McKenzie, S. J. McKay and Dr. Ruttan, to investigate what other cities are doing along this line and to prepare a by-law providing for the appointment of an inspector, which will be submitted. The advisability of closing several old wells was mentioned, but nothing was done.

New By-Law.

A new by-law, aimed to remedy housing conditions in Montreal, is now being considered by the city council. The by-law proposes to "prohibit the erection of dwelling houses on the rear part of certain lots." There was considerable discussion among the aldermen on some clauses of the by-law, particularly that portion which reads: "It is forbidden to erect and maintain within the limits of the city, on any lot having a depth of 100 feet or less, two houses one behind the other, whether such lot be situated or not between a street or lane." One alderman expressed the view that there were too many people in Montreal living "like sardines in a box." The general sanitary conditions in housing in Montreal came in for some attention during the discussion.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

A Few Handy Shop Kinks.

Editor Sanitary Engineer:—I am here enclosing a few kinks which may be new to some of your readers.

R. F. H., Sask.

Some time ago I was completing a job out in the country and required a 1¼-in. x 1-in. bushing. I simply took a 1-inch coupling and opened up the dies to 1¼, putting a thread on the outside.

And Old One, But Good.

No doubt the above is a good kink, which has been worked scores of times, but is none the less worthy of credit, and particularly when a fellow is really up against it, and has never heard of the kink before.



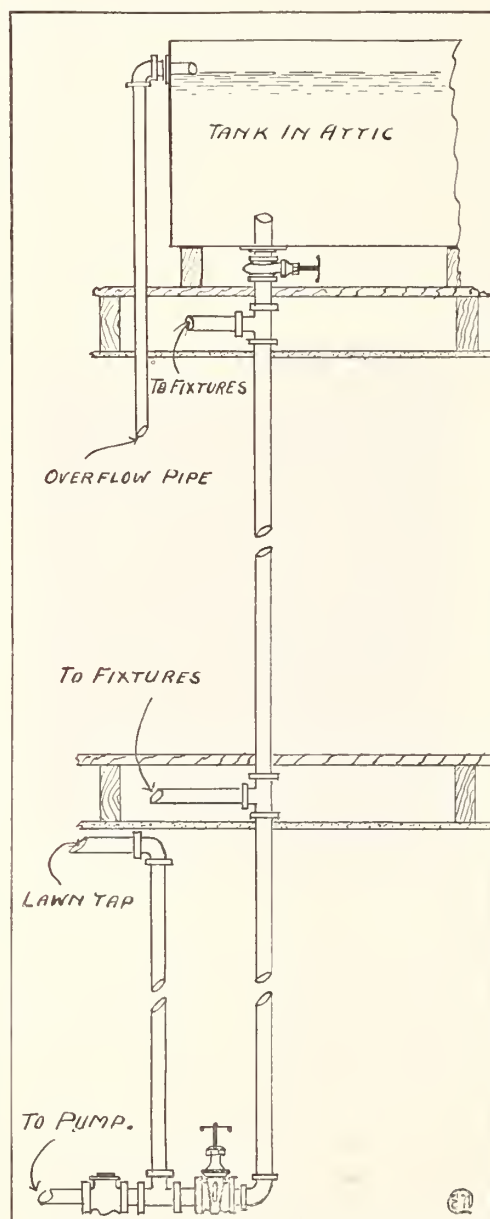
How Should Elevated Tank Be Piped.

Editor Sanitary Engineer:

I have been asked to install some plumbing in a farm house. There is a large tank up in the attic which was installed some time ago but not used. The farmer wants me to put pipes in so he can throw the water some distance from a hose. He has raised the question of a fire apparatus, and of course his elevated tank would be useless for any greater height than several feet below the tank itself. Can you suggest any way I can improve on the system of running the pipe from the pump to over the top of the tank.

A SUBSCRIBER,
Manitoba.

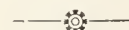
Replying to "A Subscriber," we may state that first of all, a pneumatic tank is the best method known for a system of water supply on farm houses or country residences. These systems can be bought from several of our advertisers and all instructions are given as to pipe sizes, capacity, etc. However, if the farmer is bent on having the attic tank put to use, we will show in accompany-



How to Pipe Attic Tank.

ing drawing how this should be worked. First of all, care must be taken regarding the location of the pump to the water. Next is to see that all pipes are reamed, that the fewest possible number of elbows are used, and where it is possible to use bent pipe, it should be used.

It will be seen in the drawing submitted that near to the pump is placed a check-valve first, then a gate-valve. These are placed in such a way as to be able to close the valve and run the pump, giving a pressure at the hose line. In case of fire, the pump could then be used incessantly; this valve could also be used in case any dirt got into the seat of the check valve. Then a valve should be placed close to the tank, or above the highest fixture, so that in case a washer needs to be put on a tap or other repairs are required to be made, this valve can be closed. This method of piping is far better than running the delivery pipe over the top of the tank as in some cases when tanks are tall in construction it would require at least a foot greater head.—Editor.



Does It Pay to Turn Heat Off at Night?

Editor Sanitary Engineer:—The question as to whether it is advisable to turn off the steam and bank the fire up at night is one which has been put up to me many a time. This case which I have in mind is that of a large office building. Could you give me your opinion in a future issue of The Sanitary Engineer. The caretaker of the building tells me he has to fire up for three hours in a morning before he can get the place warm, and that he burns more wood and coal in those three hours than it takes to heat the place the whole day.

A. I. R.

Replying to "A. I. R.," we may state in the first place, that a building of any size would be better handled by having

a system of heat regulators installed, which would keep the building at any desired temperature. On the other hand, the fact that the caretaker is using more fuel to get up heat in a morning than it requires to maintain heat during the full day is proof enough that the heat should be kept up all night.

For instance, if it takes three hours of hard firing, the fire is being forced, and at least 30 per cent. of the heat units are going up the chimney; while with a slow fire and even heat, better combustion takes place, and a very small amount of the heat units are being wasted. Then, again, it stands to reason that with a low temperature outside and steam closed down with banked fires the temperature is bound to equalize; therefore, by maintaining a regular temperature inside a great saving in fuel will be assured.—Editor.

How to Prove That Traps be Vented.

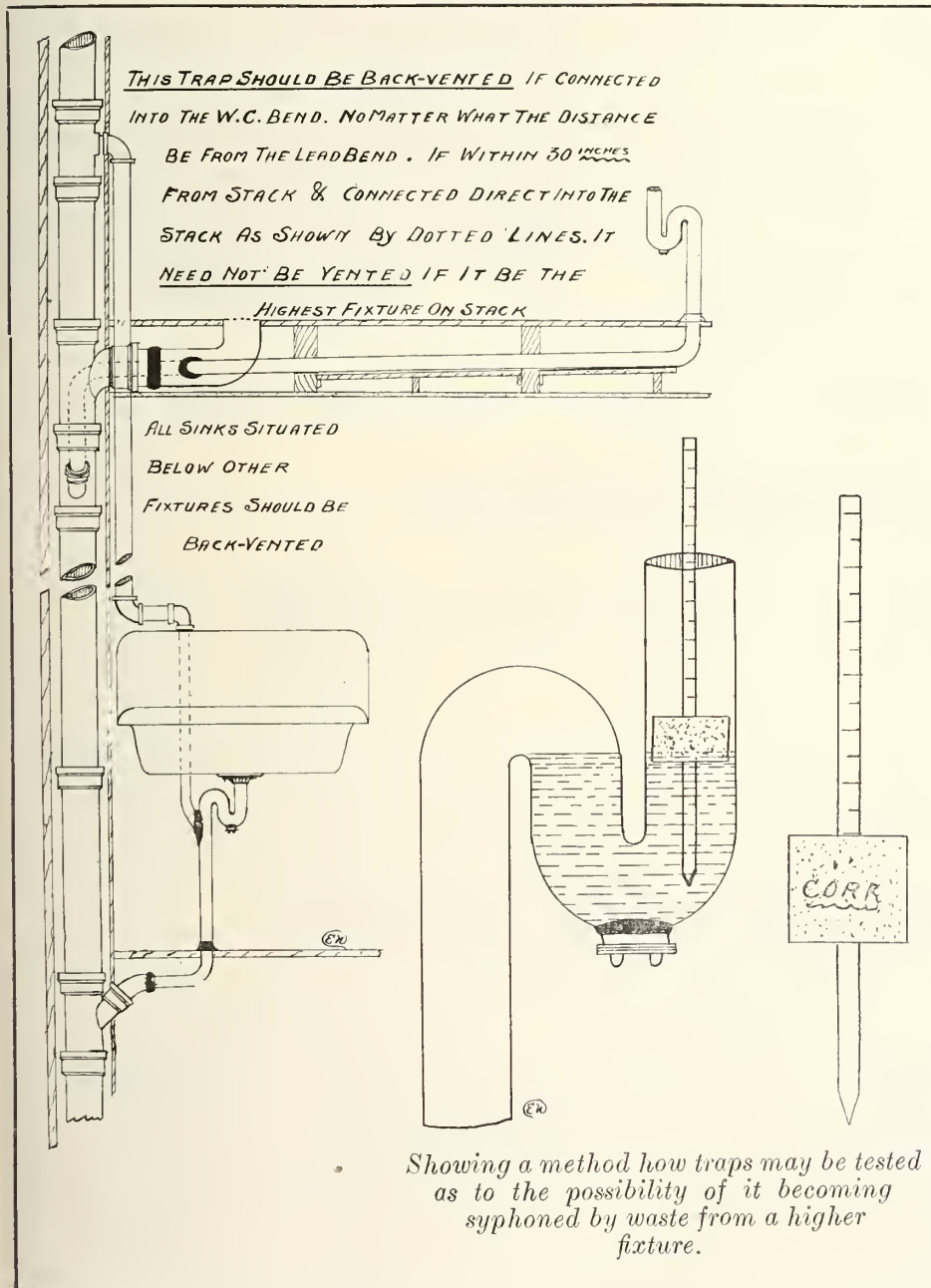
Editor Sanitary Engineer:—In several issues of The Sanitary Engineer you have stated that there are cases where a trap need not be vented, as well as conditions when it is absolutely necessary. Can you cite two cases as examples; viz., one where the trap should be vented and one where it should not?

An Interested Reader.

Replying to "An Interested Reader," we are submitting drawings. Fig. 1 shows a condition where the trap should be vented. Dotted lines to stack show where venting the trap would not be necessary. It may, however, be stated that there are scores of conditions which would or would not require the vent; and if our craftsmen will take a little more time to study, until such times as they may have grasped the true prin-

NOTICE TO READERS.

We have quite a number of readers who send in questions to be answered but fail to give us their address. We would like to receive addresses as a guarantee of good faith, also to enable us to answer their question privately. For instance, we had several questions which showed the answer was urgent, because of its very nature, and in such a case the questioner has had to wait in many cases over two weeks and more, and often a question is such that it requires more particulars. Therefore we respectfully ask our readers to give us their full address, which is not necessarily for publication.—Editor.



ciples of syphonic action and atmospheric pressures, it would be well for them to do a little experimenting. In Fig. 3 we show a small contrivance which is easily made, and can be used on almost any trap. It is made up of a cork and piece of round stick. If the person making wishes to make use of it often, it would be well to get a good sound cork, bore a true hole, and insert a piece of round wood. The upper portion of the stick could be graduated; and if the cork is thoroughly coated with hot paraffin wax it will always register the same height from the water level; but if not coated with wax it will vary somewhat after being used several times. By watching to see if any action takes place when a fixture is flushed, it can be seen whether the trap is subject to back pressure or syphonic action. It is encouraging to see the amount of interest taken in this subject; and there is no doubt that too much trap-venting is done on the one hand, and in many cases there is a need for a vent where none is inserted; but as we have stated many a time in *The Sanitary Engineer*, any man can follow a hard-and-fast rule of back-venting, but it takes a practical man to know when and when not to vent a trap or back-vent a w.c.—Editor.

SUICIDE AT SCARBORO' BLUFFS.

Lying in the bush near Scarborough Bluffs, the body of Charles Mance, a young plumber who resided at 13 Woolfrey avenue, Toronto, was found recently by Mrs. Edward Middleton and her sister, who reside in Kingston road. Beside the body, which had evidently been there for some days, were found an empty carbolic acid bottle and a rope, which led the officials to conclude that the man had committed suicide.

THE POSTMASTER-GENERAL VS. THE MERCHANT.

(Continued from page 27.)

Post Office Department from collecting postage.

This the Senate refused to do, leaving the amendment as it had been drafted, but providing a clause to leave old rates in force, thus getting around the Postmaster-General's technical objection. Mr. Pelletier refused to accept the Senate amendment and the bill thus automatically died.

He thereupon issued a statement to the press in which he claimed that his bill had been killed by the Liberal majority in the Senate.

And now comes his last move, a ludicrous finale to a comedy of errors. Mr. Pelletier has publicly announced his intention of going back to the system that prevailed before '67. He states that he will leave the rate at a quarter of a cent a pound on all second-class mail matter mailed in bulk, but that he will collect one cent on every paper that is delivered to the subscriber by the mail man. This right he claims under Clause 71 of the Post Office Act. This clause gives him the power to collect one cent postage from the subscriber, so apparently this is what the Postmaster-General, beaten and confuted at every turn, purposes doing!

Finally, let it be stated that, to those who have followed the whole course of the fight, the reason for the stand taken by the Postmaster-General is quite clear. He is standing by the big daily papers against the weekly papers and the trade and technical press. He has allied himself with the big interests which circulate mail order advertising and thus work to the detriment of the smaller communities, as against the weekly newspapers and the trade newspapers which foster the local merchant and thus help to keep trade at home, to the immeasurable benefit of the small cities and towns.

That is the issue—the issue which may perhaps have to be fought out at the next session of Parliament.

Peerless Water Systems

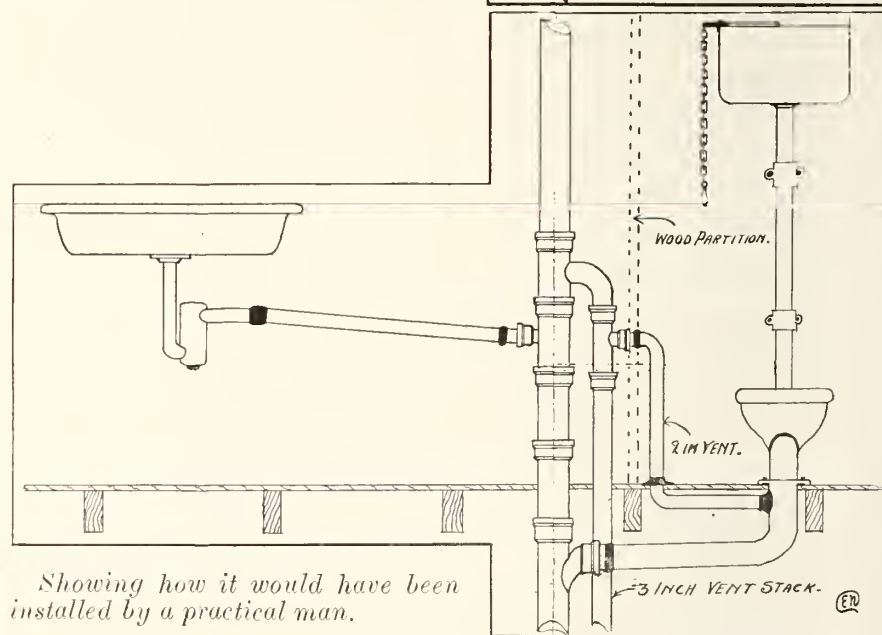
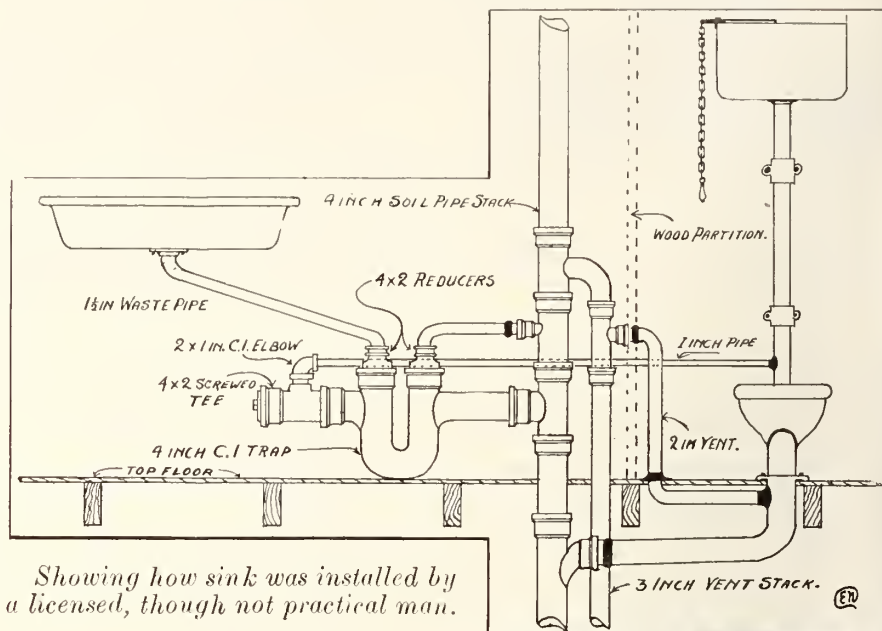
The National Equipment Co., Ltd., Wabash avenue, Toronto, are issuing a series of bulletins which deal with the various styles of Peerless pneumatic water supply systems and pumps. These bulletins are not only a work of "printers' art," but are full of valuable information for the sanitary and heating engineer. Those wishing to procure this series should write to National Equipment Co., Ltd., No. 1 Wabash avenue, Toronto.

A Correction

On page 23, July 1 issue of Sanitary Engineer.

The two cuts shown had the wrong underlines inserted. We are therefore reproducing these cuts, showing the correction.

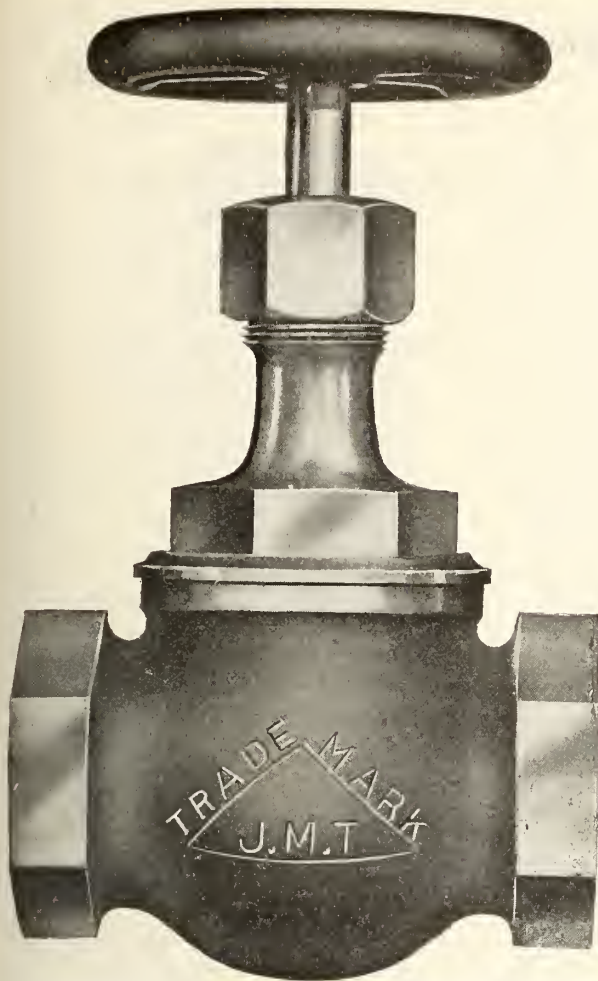
We hope, however, that most of our readers will see that it was an error on our part.—EDITOR.



EXPERIENCE THAT IS VALUABLE.

"Experience is a good teacher," is considered an important axiom, but of what use is experience if we do not profit by it? Many men are to-day behind counters who have ever so much experience who do not profit much by it. When there is something to be learned, their minds are somewhere else. They do not like it because some comparative newcomer has been pushed ahead of them, but the proprietor or manager sees that the newcomer belongs to the

get-ahead class, that he is an apt student of the business, makes what he learns count in the business, and does his work not only faithfully, but intelligently. Experience is of the greatest value to the man who is anxious to learn, but with the indifferent man whose mind, heart and soul are not in his work, experience doesn't amount to much. The thing to do is to learn all one can, and thus qualify for promotion. There is much more demand for "those who know" than for the commonplace men.



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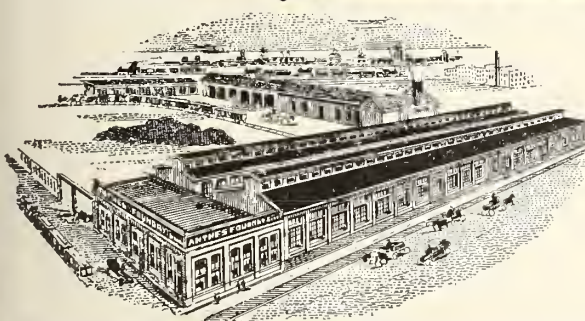
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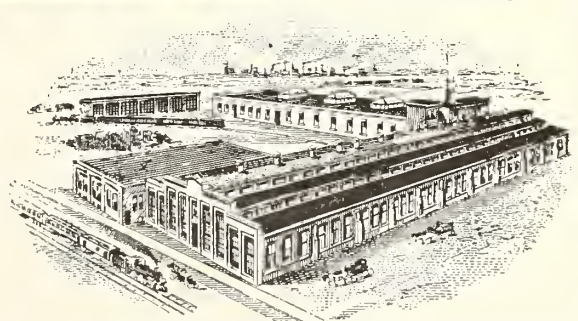
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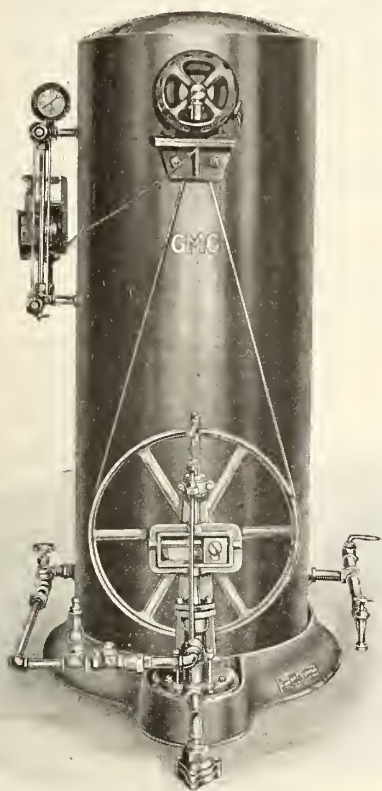
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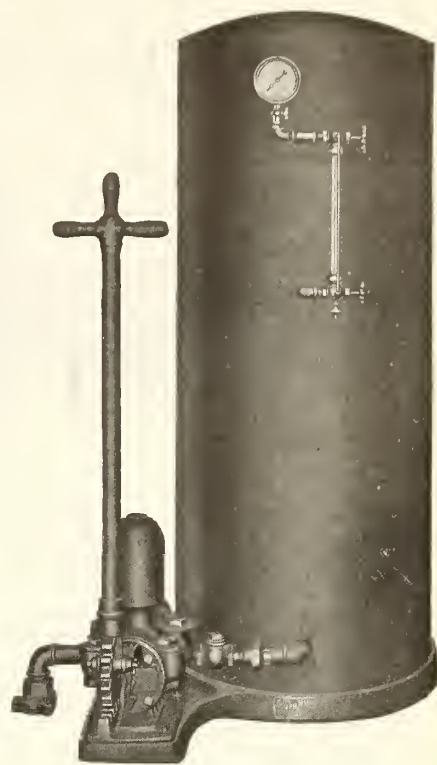
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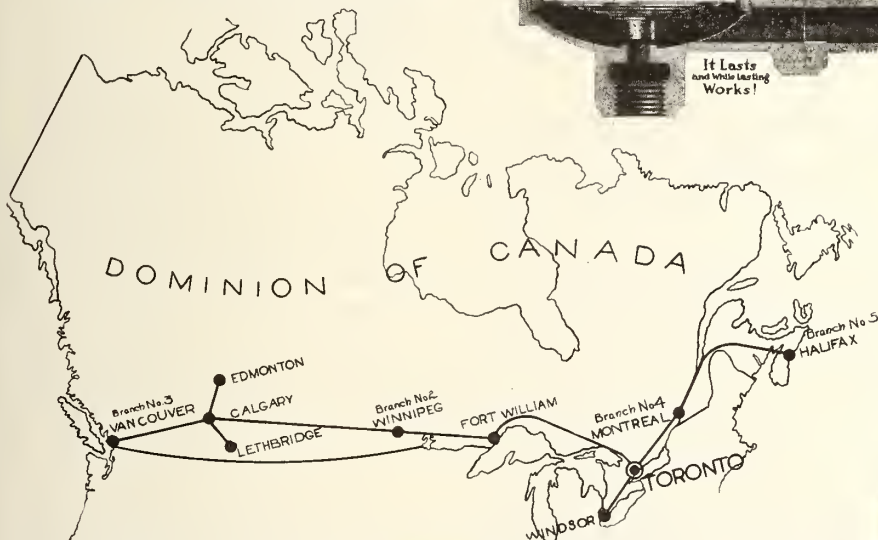
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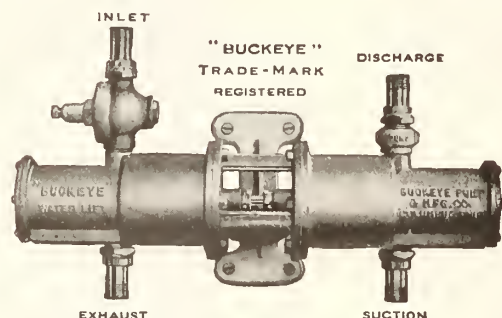
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Beaton & Cadwell Mfg. Co., New Britain, Conn.

Porcelain Ware.

Standard Ideal Mfg. Co., Ltd., Port Hope, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
Amherst Foundry Co., Ltd., Amherst, N.S.
Cluff Bros., Church St., Toronto.
Galt Brass Co., Ltd., Galt.

Pumps.

Leader Iron Works, Chicago.
Chicago Pump Co., Chicago.
C. A. Dunham & Co., Ltd., Toronto.
National Equipment Co., Toronto.
Buckeye Pump & Mfg. Co., Columbus, Ohio.
General Machinery Co., Ltd., Mulock Ave., Toronto.
James Robertson Co., Ltd., Toronto.
Cluff Manufacturing Co., Ltd., Toronto.
Cluff Bros., Church St., Toronto.

Radiators.

Gurney Foundry Co., Ltd., Toronto.
Vici Radiator Co., Hamilton.
Pressde Steel Radiator Co., Pittsburgh.
Waldon Co., Ltd., Lumsden Bldg., Toronto.
Warden King, Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.

Radiator Foot Rests.

Beaton & Cadwell Mfg. Co., Ltd., New Britain, Conn., U.S.A.

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National Steam Specialty Co., Chicago.

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C. A. Dunham & Co., Ltd., Toronto.

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Canadian Brass Co., Ltd., Galt.
Alex. I. Mearns, St. Genevieve St., Montreal.
James Robertson Co., Ltd., Toronto.

Soil Pipe and Fittings.

Anthes Foundry Co., Toronto and Winnipeg.

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Mouat-Squires Co., Cleveland.
Honeywell Heating Specialty Co., Montreal.
National Steam Specialty Co., Chicago.
Kerr Engine Co., Walkerville, Ont.
The E. S. Manny Co., Montreal.
Dart Union Co., Ltd., Toronto.

Tools.

Canadian Tap & Die Co., Ltd.
Borden-Canadian Co., Toronto.
Nye Die, Tool & Machine Co., Chicago.
Hall & Sons, Ltd., Brantford.
Armstrong Mfg. Co., Bridgeport, U.S.A.
Williams, J. H., & Co., Brooklyn, N.Y.

Unions.

Dart Union Co., Ltd., Toronto.
Fittings, Limited, Oshawa.

Vitro Tanks.

Cluff Manufacturing Co., Ltd., Toronto.
James Robertson Co., Ltd., Toronto.
Cluff Bros., Ltd., Church St., Toronto.

Vacuum Systems of Heating.

C. A. Dunham & Co., Ltd., Toronto.

Water Supply Systems.

National Equipment Co., Ltd., Wabash Avenue, Toronto.



Cut With "Beaver" Square-End Pipe Cutter.

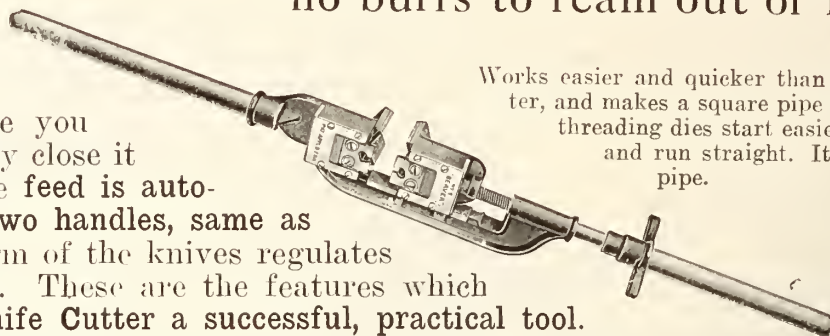


The Beaver ^{SQUARE} _{END} Pipe Cutter IS A BIG TIME AND TROUBLE SAVER

Cuts pipe off clean and square, leaving no burrs to ream out or file off.

It is not strained by feeding too fast, because you do not feed it—simply close it up on the pipe. The feed is automatic—simply pull two handles, same as a die stock. The form of the knives regulates the depth of the cut. These are the features which make the **Beaver Knife Cutter** a successful, practical tool. The largest users of Pipe have discarded wheel cutters in favor of "Beaver" Square-End Pipe Cutters, as all will do who try them.

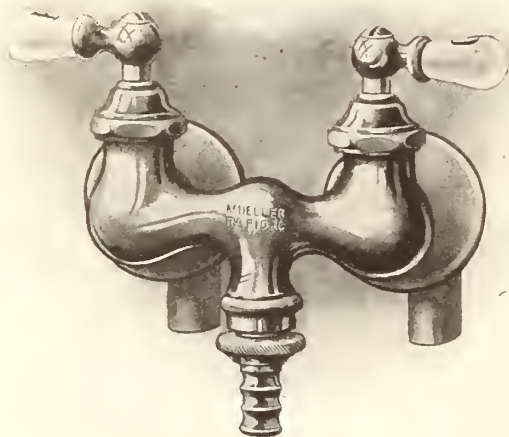
Works easier and quicker than a wheel cutter, and makes a square pipe end on which threading dies start easier, last longer and run straight. It cannot split pipe.



Done With Ordinary Pipe Cutter.

Write for prices and references.

The Borden-Canadian Co., Toronto, Ont.



Experienced Plumbers Know

that Mueller Rapidac—rapid-acting compression work—is a top notch article. It shows for itself—it has proved itself O.K. in service. Many plumbers have adopted it as a standard line and use it with satisfaction to their clients and profit to themselves.

MUELLER RAPIDAC

Fuller in shape, compression in make. It has all the good features of both Fuller and compression work—quick-opening and closing, and as durable as compression work. It won't open with the pressure. Mueller Rapidac is giving absolute satisfaction wherever installed.

CLIP AND MAIL THE COUPON.

H. Mueller Mfg. Co., Ltd.

SARNIA, ONTARIO

Makers of High-Grade Plumbing, Water and Gas Brass Goods.

S.E.

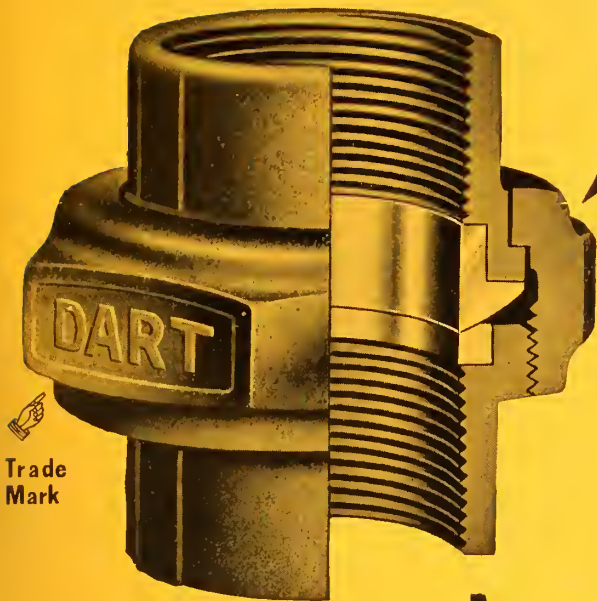
H. MUELLER
MFG. CO., LTD.
Sarnia, Ont.

Send me Rapidac
catalogue and
prices.

Signed

City Province

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."



BRONZE
TO
BRONZE
at the joint

"Dart" Unions

make permanent and practically everlasting joints between pipes. They are not affected by contraction, expansion or vibration, and will never leak unless deliberately loosened with wrench.

The Bronze on each face of the joint makes corrosion impossible.

Both faces are ball shaped, which permits connecting to be quickly and easily done whether pipes are in or out of line.

By using "Dart" Unions on pipe installation you will be safeguarding yourself against complaints and lost customers.

You can get them from your jobber in all convenient types.

If any "Dart" is defective it will quickly be replaced 2 for 1.

Dart Union Co., Ltd.

Toronto, Ont.

KERR GATE VALVES

OUTSIDE SCREW AND YOKE

"KEYSTONE" PATTERN

Embody all the latest features



4 1/2-in. and larger

Screwed-in Seats

Deep Bronze
Bushed Gland
and Stuffing
Boxes.

Full Opening.

Large Diameter
Hand-Wheels.

Solid Wedge
Discs.



4-in. and smaller

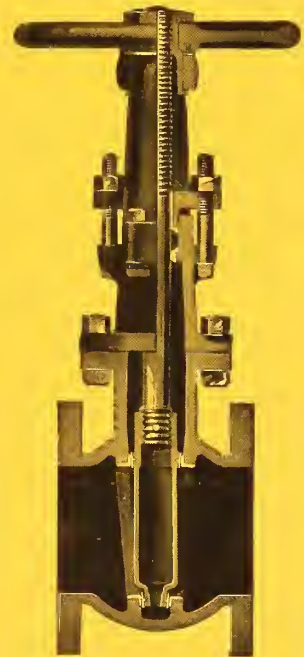
Narrow face-to-
face Dimensions

Symmetrical
Design.

Good Material.

Interchangeable
Parts.

Guaranteed
Tested.



4 1/2-in. and larger

Write at once for our new catalogue No. 5 and destroy all previous issues.

The Kerr Engine Co., Limited, MANUFACTURERS
Walkerville, Ontario

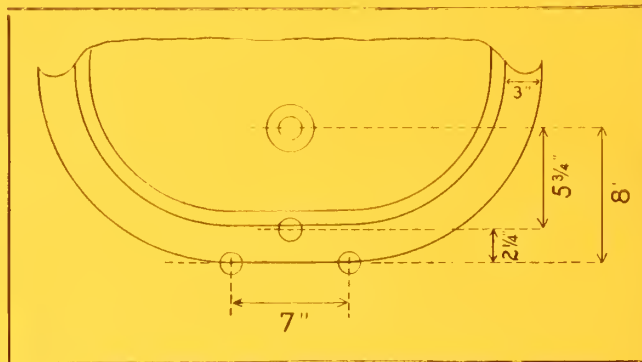
THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

GALT BRASS



"PERFECTO" (REG. 1913)

Use The "Perfecto" when in a hurry—
Saves half the time and all the worry.



"ROUGHING IN"



PERFECTO No 523

THE
"PERFECTO"

BATH COCK is a modern achievement in the quick-pressure or rapid-opening type, giving you lever action, and largest waterway made, coupled with a very attractive design.

COMBINATION WASTE AND OVERFLOW—Heavy cast parts, being adjustable, you have no tubes to cut, making it a great time saver.

SUPPLY PIPES are 3/8-inch iron pipe size and weight, seamless, annealed, offset, one piece of metal with expanded collar supporting conical rubber washer, and threaded at floor.

"ROUGHING IN" will, we trust, be of convenience to you. (All our other styles rough in the same as the "Perfecto.")

GUARANTEE—Same as we extend on all goods bearing our name.

SEND US YOUR ORDER NOW.

BATH SET

GALT, CANADA

THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

Publication Office : TORONTO, AUG. 1, 1914

No. 15

"HERCULES ENAMEL" LAUNDRY TRAYS With "Cast-In" Washboard



A CHEAP, DURABLE, SANITARY ENAMELED CAST IRON LAUNDRY TRAY To take the place of the brittle, water-logged, unsanitary Cement Tray

After considerable experimenting we have succeeded in producing a Wash Tray which we are able to offer to the trade at a price sufficiently low to interest the many prospective purchasers who cannot afford, or who are unwilling to pay the higher price for our White Porcelain Enameled Trays.

"HERCULES ENAMEL" is totally different from the regular white porcelain enamel, and its composition makes it possible to successfully cover the corrugations of the **CAST-IN WASHBOARD**, which is not feasible with white porcelain enamels. It is the **IDEAL ENAMEL** for Laundry equipment and is capable of withstanding the rapid expansion and contraction usually caused by the alternate use of Boiling Hot and Cold Water.

The **CAST-IN WASHBOARD** is a feature of these new trays. It saves the expense of the old-fashioned **SEPARATE** Washboard, which, aside from its inconvenience, is extremely unsatisfactory, in that it must frequently be repaired or replaced. In the new "HERCULES" Trays the washboard is there forever.

It's New—It's Practical and Durable and—It's Cheap. Write for circular and prices.

MADE ONLY BY

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

TORONTO
119 King St. East

MONTREAL
42-44 Beaver Hall Hill

WINNIPEG
76-82 Lombard St.

VANCOUVER
410 Carter Cotton Bldg.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

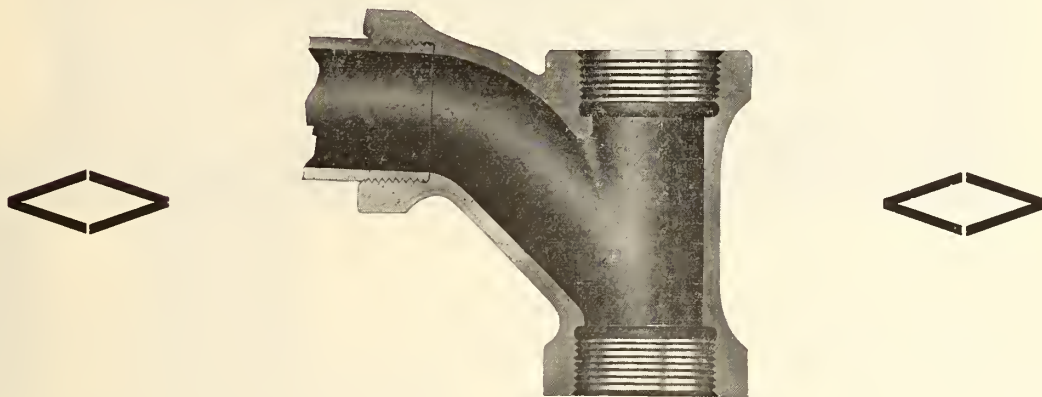
ONTARIO:
Monarch Brass Mfg. Co.,
178 Victoria St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes,
120 Lombard St., Winnipeg

BRITISH COLUMBIA:
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RECESSED DRAINAGE FITTINGS

**We are now Manufacturing
a complete line**



FITTINGS LIMITED OSHAWA

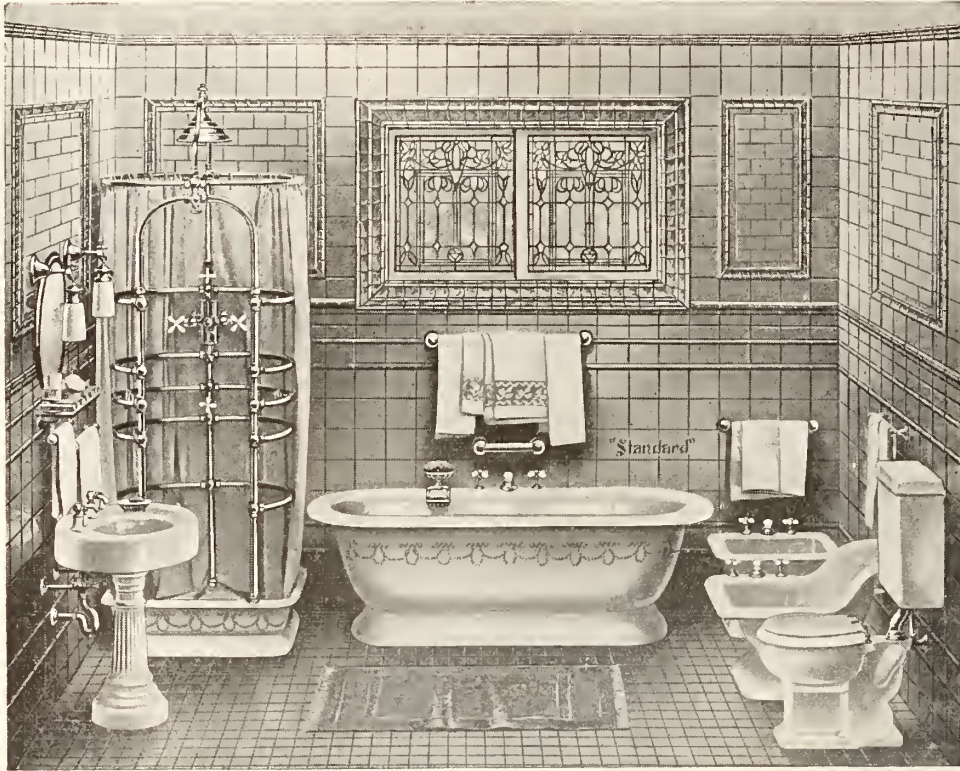
MONTREAL

WINNIPEG

VANCOUVER

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

“Standard Sanitary” Plumbing Fixtures



“Standard Sanitary” Bathroom of Queen Victoria of Spain.

The above cut was made from a photograph of the fixtures actually installed in the Royal Palace of La Magdalena, Santander, Spain, the summer residence of their Majesties, the King and Queen of Spain.

A similar bathroom was also installed for the King, and eighteen other complete “Standard Sanitary” Bathrooms for the other members of the household.

This is an extremely practical and beautiful interior and combines with beauty and refinement every modern sanitary idea.

The fixtures are set into the tiling, thus offering no place for dust or moisture to collect, and reducing cleaning labor to a minimum.

The Foot, Sitz and Shower Baths make an unusually complete and artistic bathroom at a cost that is very reasonable, considering the quality of fixtures shown.

“Standard Sanitary” plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales-agents throughout the Dominion.

Standard Sanitary Mfg. Co., Limited

General Offices and Factory:

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Toronto Store:

55-59 Richmond Street East.

Hamilton Store:

20-28 Jackson Street West.

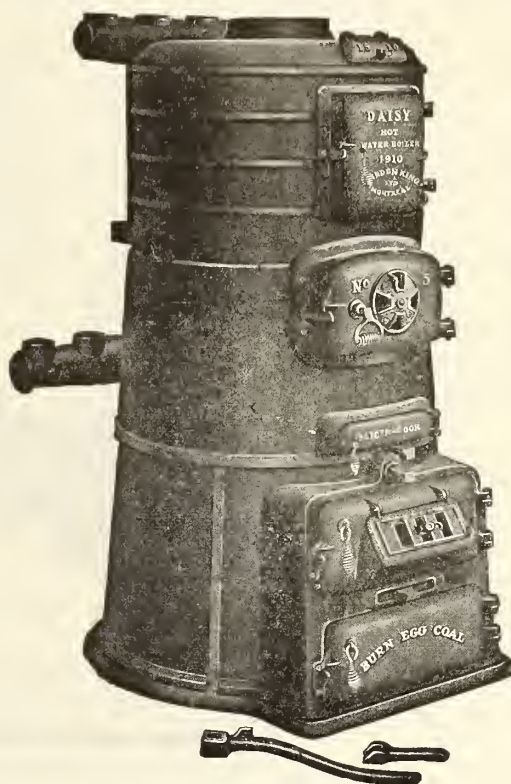
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THE DAISY BOILER

Over 55,000 DAISY Boilers

are giving the best of service throughout Canada.

The Daisy has qualities which make it a better proposition than any other on the market.



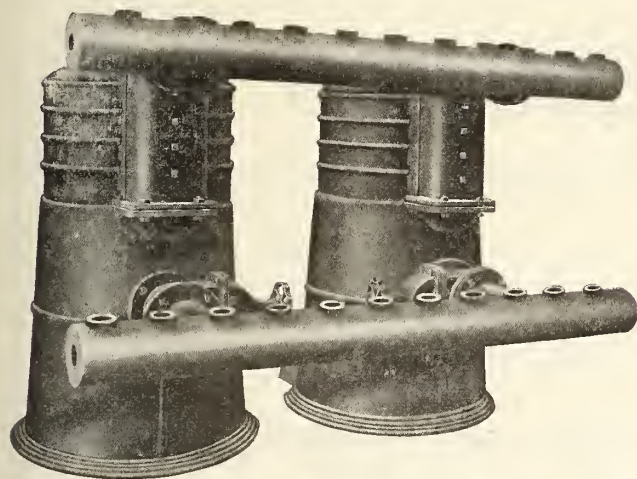
Made in the best equipped plant in Canada.

Without doubt the most popular boiler made.

Every installation means another customer satisfied.

Minimum consumption of fuel.

Maximum amount of heat.



Rear view of two Daisy Boilers connected with twin headers. This system gives great satisfaction in mild and extreme weather.

WARDEN KING LIMITED, MONTREAL

BRANCH, 200 Adelaide St. West, TORONTO

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The MECHANICS' SUPPLY CO., Limited, QUEBEC, P.Q.
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The WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

It doesn't cost

us much more to
make **SYDENHAM** goods
than it does to make
the cheaper kind, and
it certainly pays to
use them on every
job when the **best** is
required and your
reputation is to be
maintained.

EVERY PIECE
GUARANTEED

Sold by jobbers from
coast to coast

Made by
**THE WALLACEBURG BRASS & IRON
MANUFACTURING CO., LIMITED**

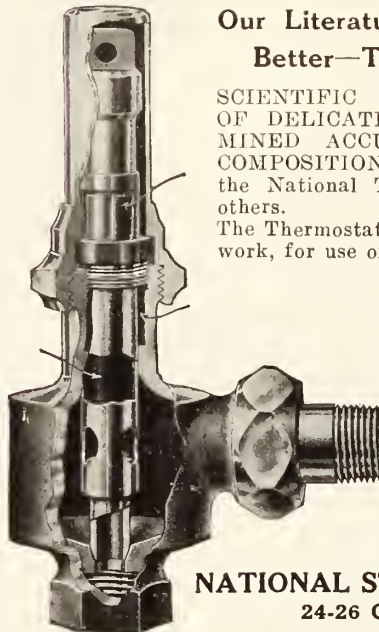
WALLACEBURG, ONTARIO

Winnipeg,
Moncrieff & Endress, Ltd.
Scott Bldg.

Toronto,
L. N. Vanstone,
8-10 Wellington St. E.

Montreal,
J. R. Devereux
142 St. Joseph Boulevard West

National Valves.
Scientifically } Correct
Economically }
Usefully }



Our Literature Tells Why They're
Better—Their Use Proves It.

SCIENTIFIC CONSTRUCTION—ABSENCE
OF DELICATE PARTS — PRE-DETER-
MINED ACCURACY — BRASS-ENCASED
COMPOSITION—all of these are features of
the National Thermostatic Trap—there are
others.

The Thermostatic Valve is adapted to various
work, for use on Vacuum Systems, Dry Kilns,
etc., etc., and is guaranteed
for 5 years.

If you want Perfect Serv-
ice, based on perfect valve
principles, the National
Thermostatic Valve will
answer this purpose.

Write for our literature on
the complete National Line,
such as the B Heat Intensi-
fier, B Pipe Joint Com-
pound, "Perfection" Rad-
iator Fitting, etc., etc.

NATIONAL STEAM SPECIALTY CO.

24-26 Clinton St., Chicago

Surpless, Dunn & Co., 74 Murray St., New York
L. N. Vanstone, 8 Wellington St. East, Toronto
Moncrieff & Endress, Limited, Scott Bldg., Winnipeg

300,000 lbs.

carried in stock for immediate
shipment of

Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

Brass and Copper Rod.

Brass and Copper Sheet.

WRITE US FOR PRICES

Tallman Brass & Metal Co.
HAMILTON, ONT.

A Powerful Canadian Story

A new serial story has been started in the August issue of MacLean's Magazine that YOU will want to read. It is not often that you find a story that appeals to you in every way. This one will. It is strong, readable, clean—and Canadian.

There are three elements that are needed to make a good story—Adventure, Mystery, Love. "Twisting Trails" has them all. It has the convincing appeal of realism; it has plenty of action—not too much—a thrilling mystery that is not cleared up until the finish; a heroine who steps right out of the printed page and becomes to the reader a real, flesh-and-blood person. There is nothing of the taint of modern day fiction about this tale of Northern Ontario. Not complex in theme or doubtful in treatment. Just a strong narrative of a stirring series of adventures, told with all the charm and graphic power of this well-known young Canadian writer.

In fact, just the very type of story YOU like to read.



Rea Straine,
the central figure of
Pinkerton story,
"Twisting Trails."

"Twisting Trails" The story of a fight for a gold mine

Robert E. Pinkerton's new story, "Twisting Trails," centers around a struggle for the possession of a valuable mine. Two pretty girls are introduced into the story and both become lost on the trail to the mine. Enter the villain, a detective, a college student; and the stage is set for a story that has the unusual attraction of being new—quite distinctly original, not an old theme rearranged and rewritten.

He writes of the life he knows

There's another reason why this story grips the interest from start to finish. The author is writing of the country and the life that he knows. Robert E. Pinkerton and his wife live in a six-room cabin, built entirely by himself, in the bush eight miles from Atikokan, Ontario. Their only means of communication with the outside world is by canoe in summer and dog-team in winter. There they work—for Mrs. Pinkerton is a successful writer and collaborates with her husband in all he does—free from the distractions of modern life, aided to true standards by close communion with Nature and their life in the open. They expect to live in the woods for the rest of their lives.

Mr. Pinkerton has out-Londoned Jack London. Newspaper reporter, editor, press agent, bull cook, Indian trader, trapper, guide, farmer, fisherman; he has been them all. All of which explains why Robert E. Pinkerton writes stories that are full of human interest, that breathe familiarity with life in all its phases. And which explains also why no one can afford to miss the opening installment of "Twisting Trails"—for the new serial is one of Mr. Pinkerton's very best pieces of work.

Send for a free copy of the August issue to-day. Clip out this coupon and address to MacLean Publishing Co., 143-153 University Ave., Toronto, Department F.

Send free copy of
Magazine to
Name
Address
S.E.
August number of MacLean's

SOMETHING

NEW

THE GEYSER
AUTOMATIC
WATER HEATER

is composed of a vertical cylinder from four to six feet long, according to size. The cylinder contains brass pipes which receive the steam and transmit heat to the water. These pipes are screwed to the base chamber, but remain independent from one another at the top, consequently, the expansion is entirely free, and leaks are impossible.

FULLY GUARANTEED
MANUFACTURED BYTHE E. S. MANNY CO.,
MONTREAL

Our Large Variety of

Floor and Ceiling Plates
enables our customers to buy anything they desire, and we can make special plates of any kind on short notice.
300,000 ALWAYS ON STOCK in sizes from $\frac{3}{8}$ to 4 inches.
Our No. 10 Hinged Pressed Steel or Brass is our most popular plate.
WE MANUFACTURE EVERYTHING THE SANITARY ENGINEER NEEDS.

The BEATON & CADWELL MANUFACTURING CO.
New Britain, Conn.
Eastern Agent: J. R. Devereux, 142 St. Joseph Boulevard West, Montreal.
Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

WOLVERINE

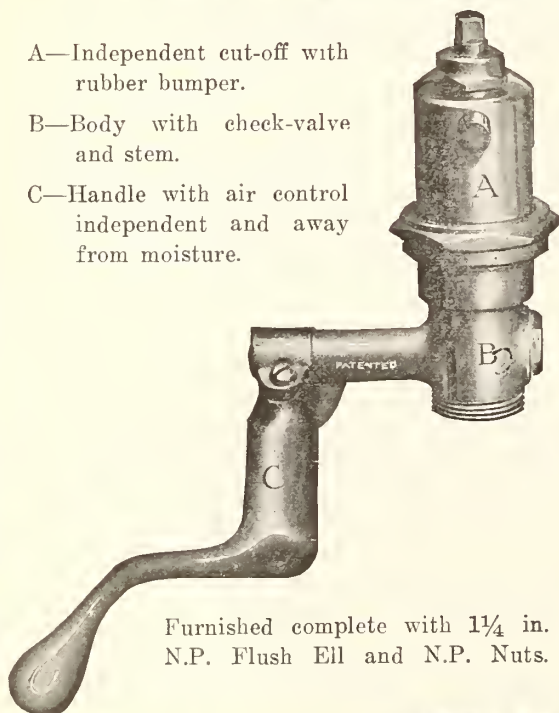
QUALITY

Wolverine Flush Valve

PATENTED

Durable - Inexpensive - Economical - Simple

- A—Independent cut-off with rubber bumper.
B—Body with check-valve and stem.
C—Handle with air control independent and away from moisture.

Furnished complete with $1\frac{1}{4}$ in.
N.P. Flush Ell and N.P. Nuts.

The only Direct valve on the market. No small by-passes to stop up or corrode and each valve is furnished with independent cut-off with rubber seat bumper.

Flush can be adjusted without shutting off the water.

For Direct pressure or gravity systems. Write us for price and further information.

Manufactured and guaranteed by

Canadian Wolverine Co.
LIMITED

Chatham, Ont.

EVERY ARTICLE

GUARANTEED

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AN EXTRA DISCOUNT OF 10%

On all orders for
Fig. 112 Series

Peerless Water Systems

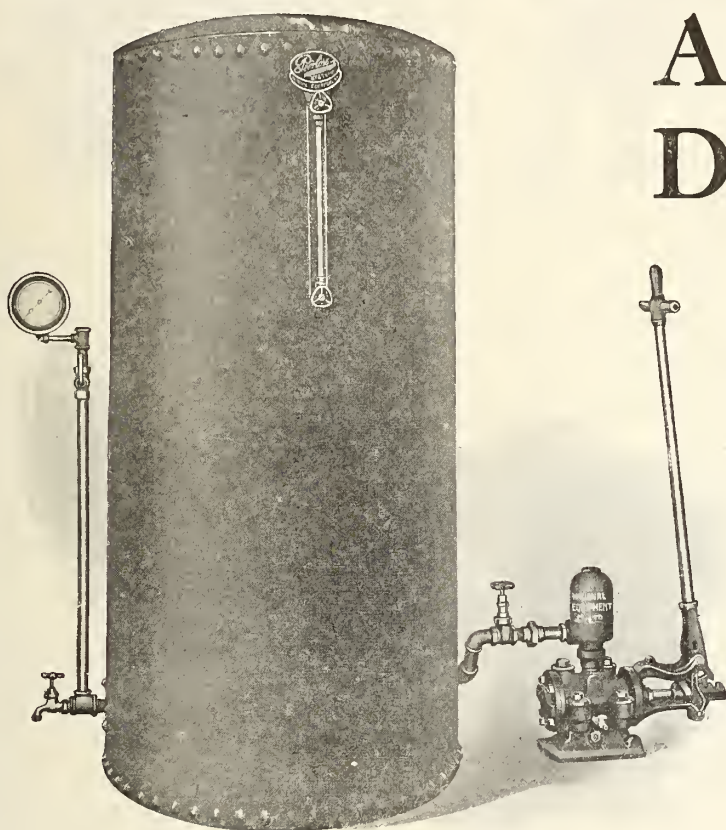


Fig. 112 Series

Placed during September—for delivery up to October fifteenth, this year.

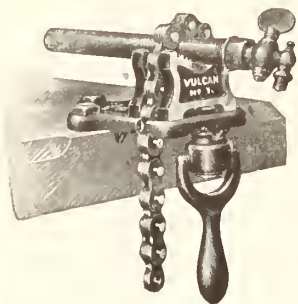
LIST PRICES:

Complete as shown with 24 x 6 Tank	.....\$ 80.00
“ “ “ “ 30 x 6 “	..... 92.00
“ “ “ “ 36 x 6 “	..... 102.00
“ “ “ “ 36 x 10 “	..... 135.00

You know the regular discount to the trade — with another 10% off. You can make some money if you place your order **now**.

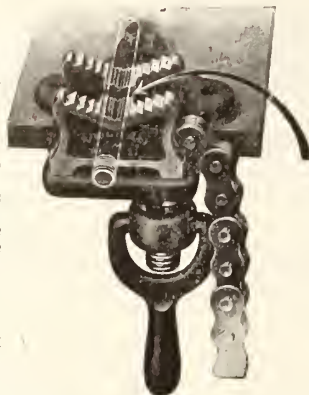
National Equipment Co., Limited
TORONTO, ONT.

Williams Unusual "VULCAN"!



BECAUSE "VULCAN" Vises are unbreakable in service.

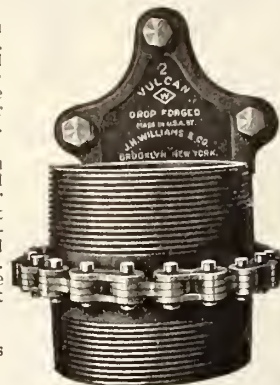
BECAUSE no other vise will hold irregular shapes as well. Either Fittings or Pipe are "meat" for the "VULCAN."



BECAUSE if you wish to bend pipe, no other Vise will help as much. Use an eye-bolt in one of bolt holes for "staying" the pipe.

BECAUSE if you don't want to bend the pipe no other tool will prevent it in a better way — see the extended teeth on jaws (No. 1 size) and the "wrapping" contact of chain.

3 sizes, capacities $\frac{1}{8}$ to 8" pipe.



Send for Dependable Chain Tools Pamphlet or consult your dealer.

J. H. Williams & Co., Superior Drop-Forgings 77 Richards Street, Brooklyn, N.Y. City.

"THE DUAL"

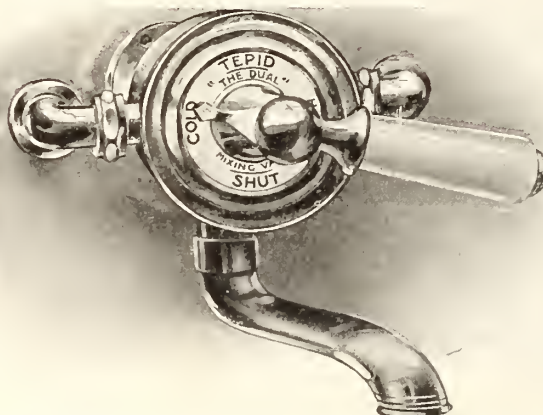
Compression Mixing Valve

The
Finest Industrial
Bath Installation in
EUROPE

is at

Messrs. Brunner
Mond Co.,
Northwich, Eng.

where 2000 employ-
ees are provided for
by these mixers.



Strong and well built,
made to stand hard usage.

It can be taken to pieces
without disturbing connec-
tions.

Made in various types for
baths, lavatories, showers,
etc., also special stock pat-
tern with one or two out-
lets at option for making
up sets.

Send for descriptive booklet

Made by GUMMERS LIMITED—Effingham Brass Works—ROTHERHAM, ENGLAND.

Canadian Agent:—GEO. CARPENTER, 314 University Street

MONTREAL

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, $\frac{1}{8}$ IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

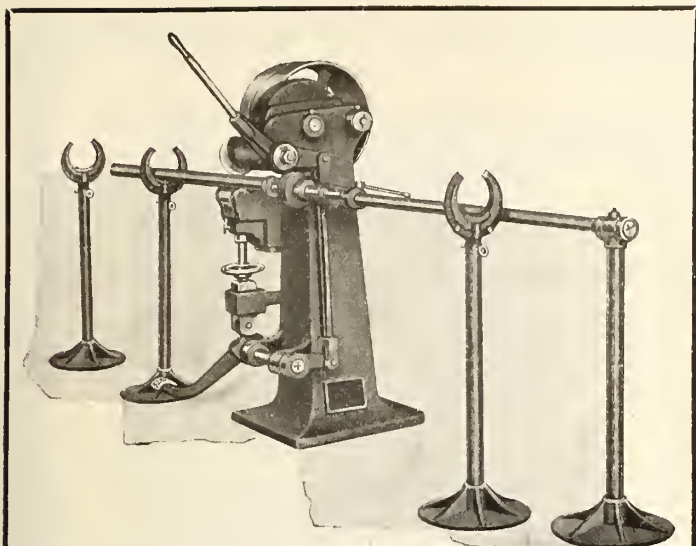
Ask your jobber for



Brand

CANADIAN TUBE & IRON CO., LIMITED
Montreal Works: Lachine Canal

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."



The Hall No. 2 Rapid Upright Roller Pipe Cutter for Rapid Work and a Clean Cut

By repeated tests this machine has proven the most efficient and economical pipe cutting device on the market, and is used for this purpose by all of the tube mills in Canada and most of the leading plumbing and steam-fitting houses.

Regular capacity $\frac{1}{2}$ to 2-in., with extra cage will take $\frac{1}{8}$ to $\frac{3}{8}$ -in. pipe.

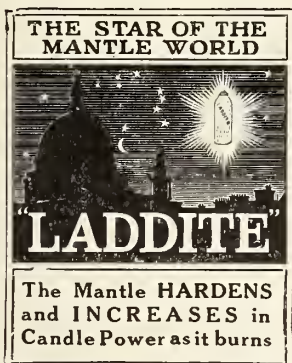
Write us for catalog and prices on pipe threading lathes, any capacity from $\frac{1}{8}$ to 18-in., also single and double head rapid nipple machines. No delays, delivery from stock.

JOHN H. HALL & SONS, Limited
BRANTFORD, CANADA

Gas Companies and the Public demand a Strong, Durable Gas Mantle with a high candle power, and at popular prices. The Trade can now absolutely rely upon being able to supply such a mantle in the Laddite.

Awarded
Gold Medal
Franco-
British
Exhibition
1908.

Mantles
made and
supplied for
oil, gasoline,
air gas,
acetylene,
and light-
houses.



Full
particulars
of the
merits of
the Laddite,
together
with terms
for
wholesale
and retail
trade,
furnished on
application.

Millions of Laddite Mantles now in use throughout Great Britain and abroad.

Manufacturers under the "Laddite Process."

The Hamilton Gas Mantle Co.
LIMITED

18-24 Ferguson Ave. N., Hamilton, Ont.

NICHOLSON MADE FILES

Filing
Down
Shop
Costs

Are you already benefiting by the use of

Nicholson Made Files?

Are you enjoying a high degree of Filing-Efficiency with a very low Filing-Cost? These are the ordinary advantages of using NICHOLSON BRANDS.

But don't miss the extraordinary advantages of using MORE Nicholson-Made-Files.

Educate your workmen to throw away their half-worn Files. Give them two to use where they now use one. In this way, you'll increase their output and accuracy to such an extent, that your net filing-cost will decrease 25% to 50%. Enough to pay many times over the slight increase in the cost of files.

Make a trial of this plan in your shops. Your own records will furnish indisputable evidence that this is a profitable plan for you to follow.

Brands:

Kearney & Foot Great Western
American Arcade
Globe

NICHOLSON FILE
COMPANY, LIMITED

PORT HOPE, ONT.

"FILE PHILOSOPHY." A 50 years' education on files in an hour, and our Catalogue, sent FREE on request.

SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, AUGUST 1, 1914

No. 15

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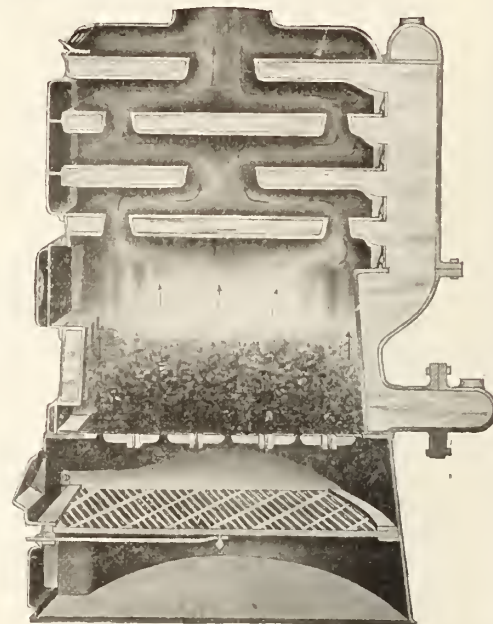
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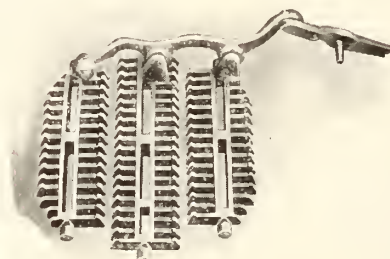
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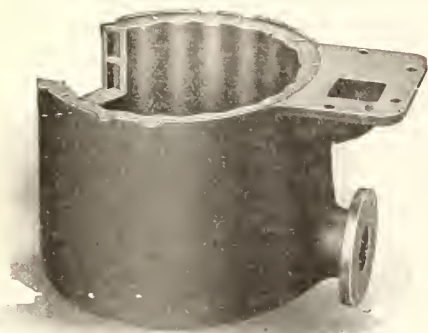
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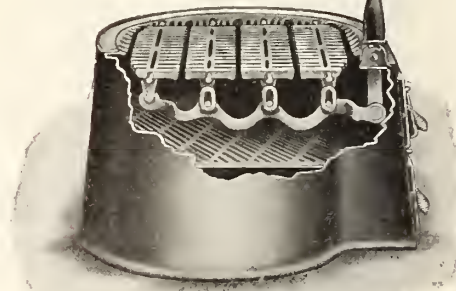


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THE SANITARY ENGINEER

VOL. VIII.

AUGUST 1, 1914.

No. 15

Sanitary Inspectors in Convention at Winnipeg

Want Their Status, Tenure of Office and Qualifications Determining—Instructive Papers by Thomas Watson, Regina, and W. D. Mathias—E. W. J. Hague Re-elected President.

FROM Wednesday, July 15, to Saturday, July 18, members of the Sanitary Inspectors' Association of Winnipeg, the first three days being spent in visits of inspection. Friday evening was set apart for general business. Early Wednesday morning, the convention received a civic welcome from the mayor, T. H. Deacon, which was followed by the presidential address, delivered by E. W. J. Hague, president of the association. The afternoon was spent at the Winnipeg Exhibition.

On Thursday morning the delegates were conducted over the plants of the Crescent Creamery Co. and the T. Eaton Co. At the latter place they were provided with lunch, later being conducted through the plant by P. B. Tustin, chief food inspector, Winnipeg. In the afternoon the ventilating plants of the Free Press Building and the Walker Theatre were inspected, followed in the evening by a visit to Milton's Bakery.

Friday the delegates visited the various divisions of the city health department, were shown health films at the Rex Theatre, and in the afternoon were the guests of the Anglo-Continental Fertilizers Syndicate, Ltd., at a demonstration of sewage purification at a small plant on Aubrey Street. The guests were received by Captain C. E. Morgan, Canadian representative, who provided each guest with a typewritten description of the plant, together with statistics showing the analysis of a sample of Winnipeg sewage before and after treatment. On Saturday the delegates were entertained at Kinalmeaky Dairy Farm, Headingly.

Legislation Wanted.

At the business meeting on Friday evening Thomas Watson, Regina, urged that Provincial Governments be asked in their Health Acts to define the status and duties of a sanitary inspector. E. W. J. Hague, president of the Association, informed the Convention that negotiations were proceeding with the Manitoba Provincial Board of Health to have an understanding on the status and

tenure of office of inspectors, as well as on their qualifications. P. B. Tustin recommended that the certificate of the R.S.I. be recognized by Provincial Boards of Health.

Light and Ventilation.

A paper on "Light and Ventilation as Factors in Public Health" was read by Thomas Watson, Provincial Sanitary Inspector, Regina. Public health work, he said, was a work of prevention, whose



E. W. J. HAGUE.
President of the Sanitary Inspectors' Association of Western Canada.

object was to conserve health by using every means that Sanitary Science had proved to be effective. Light and ventilation played a great part, and for a long time no two natural agents were more disregarded as means for benefiting mankind than these two.

Looking back at the provisions made in the past for light and ventilation, they could see how little use had often been made of them as forces for preserving health. It seemed as though they were purposely ignored. In the apartments of modern times, with all knowledge of the value of light and

ventilation, conditions of healthy living were being subordinated to avarice and ornamental mantels, with bedsteads on the reverse side, taking the place of airy bedrooms.

We were only beginning, he said, to realize the beneficial virtues of natural forces and their superiority over mechanical or artificial ones as agents in the preservation of health and life. Light and air were the chief factors being used for the prevention of disease. Whereas in bygone days any place—cave, cellar or erection having an apology for a roof—was allowed as living quarters, we had now laws prohibiting places not provided with light and ventilation. Much more had been done for workshops than for homes. The great improvements brought about in the construction, lighting, ventilating and conveniences as required in workshops, bakeries, factories, has been the means of reducing the death rate per 1,000 from 30 to 17 during a period of 25 years. In this regard, Sanitary Science has proved that care for health of employees was an asset to be taken account of on the credit side of the balance sheet.

There was no branch of sanitary work, he said, in which light and ventilation were more employed, and the average citizen would use them if the beneficial results were explained to them. Therein lay their opportunity as Inspectors. If they failed to offer reasons proving that their contentions were both practical and profitable, they then lost respect as educators of the Science of Hygiene.

The Common Privy.

If they took advantage of light and ventilation in the process of sewage disposal, in the carriage and removal of house drainage, in the selection of sites for dwellings, was it less necessary to provide for the same in the arrangement and construction of that most abominable and seemingly irremediable contrivance—the common privy? Even that could be made sanitary if provision were made for the removal of the effluvia by continuous change of air.

Provision for light ensured means for



SANITARY INSPECTORS VISITING THE PLANT OF THE ANGLO-FERTILIZERS SYNDICATE LTD., WINNIPEG.

First two rows, beginning with the inspector at rear and to right of man in white suit:—A. McF. Allan, Weyburn; "Free Press" representative; A. G. Warr, Prince Albert; A. Rigby, Winnipeg; J. Martin, Regina; H. Moore, Winnipeg; Dr. Bowman, Winnipeg; A. Paull, Winnipeg; A. W. Foote, Winnipeg.

Seated:—Employee of sewage plant in white jacket; W. F. Thornley, Winnipeg; P. B. Tustin, Winnipeg; E. W. J. Hague, Winnipeg; Alex. Officer, Winnipeg; Thomas Watson, Regina; Captain Morgan (who conducted the party), and H. S. Sturgess (standing).

ventilation; therefore, it was more light they wanted.

A discussion followed this paper, and it was suggested that efforts be made to induce municipalities to have plans for new buildings submitted to the Health Department or Sanitary Inspectors before building permits were granted.

"Notes and Queries."

This was the title chosen for a paper written by W. D. Mathias, Secretary of the Saskatchewan Branch, Regina. Mr. Mathias being ill, was not present, so the paper was read by the President. There is a time, he said, when it was thought sufficient to get sewage matters from the household out of sight, when unjointed drains were run into pervious cesspools constructed below the dwelling, when one cesspool having become filled, another was dug alongside, and when, so long as flooding did not occur, no further anxiety was felt. Later on endeavors were made to "keep back the stench," and traps in various forms were imposed on drains, soil and waste pipes. A little later the odor of gases from decomposing sewage was looked upon as an index of what might accompany it, and be the means of spreading infectious diseases. Drainage was trapped and double-trapped, and the consequence was that the aerial contents of the conduits were in a state of concentration, ready to force the traps in a peculiarly nauseous form. Experience

then led to the introduction of air as a diluent, though all sewer air was looked upon with great apprehension. The isolation of each building from every other by means of a main disconnecting trap was insisted upon; and to-day they had its total abolition advocated, and in certain places they had the old cesspool improved so that it was a bacterial tank.

"Are we to look upon emanations from sewers and waste pipes with equanimity because we have been told that such gases are not so prolific in the spread of disease as at one period they were thought to be," he asked. Were they to be less careful as to the arrangement of drain, soil waste and vent pipes because the house-trap had been abolished? The reply should be emphatically in the negative. Although sewer air did not contain the germs of specific disease, it was an admixture of gases in various proportions, gases of decomposition undesirable for respiration, lowering to vitality, and predisposing to disease.

Danger of Dug-outs.

Speaking about the dig-out cellar and the site on which the smaller house stood, he claimed that in too many cases the original dug-out was a menace to health because of its cribbing having rotted and become insecure, and covered with fungus. The floors were generally damp, if not actually water-logged, even when there happened to be a drain trap in connection. Basements of rather bet-

ter construction were sometimes found without cemented floors, but apart from the greater or lesser inconvenience of having a mud floor to contend with, there was the question of what had been termed "ground air." For the sake of economy in warming, it had been the practice to build small houses as near the ground as possible, and the surface usually taken as it was found, with growth of grass or weeds. If concrete could not be enforced, then would it be too much to ask for a cleared ground site?

In conclusion, Mr. Mathias congratulated the Association on its success, both as regards numbers and the beneficent work accomplished, mainly in an educational way.

Finances in Good Shape.

Financially, the Sanitary Inspectors' Association of Western Canada is sound, as shown by the report, presented by Alex. Officer, secretary-treasurer, the balance in bank being \$147.51. The Executive Committee meet each month. At the last annual meeting, in Regina, the membership was made up of 33 members and 31 associates, and now there are 46 members and 38 associates. The branches are Manitoba, Western Ontario, Saskatchewan, Alberta and British Columbia.

The action of North Battleford in appointing a qualified man from the Winnipeg health department staff as sani-

tary inspector is taken as a valuable tribute to the efficiency of the organization, and the passage of a by-law by the City Council of Winnipeg debarring all but qualified persons from employment in the health department, is another victory for the principles upheld by the Association.

Vice-President Walter E. Stanley, of the Western Ontario Branch, who is a Fort William official, reported for his branch that though the membership and scope of the branch is limited to the two lake cities at present, he is enthusiastic and assured the convention of the activity of its members and associates in that branch.

Western Branches.

Reports were also presented from the vice-presidents of the Western branches, including Thos. Watson, Regina, whose branch has three centres, Regina, Moose Jaw and Saskatoon, all flourishing; J. J. Dunn, Calgary, for Alberta, and F. J. Glover, Kamloops, B.C.

Mr. Watson reported the appointment of a chairman for each centre, and a vigorous prosecution of the work of the association by means of meetings at which papers were read and discussions held on the subject of most interest and importance to the members, as well as visits to larger institutions, such as the Gordon, Ironside and Fares abattoir and packing plant, the Robin Hood flour mills, and the city sewage disposal works in Moose Jaw. Mr. Watson had a resolution before the convention from his branch, asking for the views of all the members on the dismissal of sanitary inspectors, as to whether such dismissal should not be submitted to the provincial health authorities. As an individual, Mr. Watson declared that since the organization has been formed he felt strengthened in his work and derived benefit from the advice and co-operation of his fellow-members.

J. J. Dunn, of Calgary, reported a serious handicap in the lack of branches of the Royal Sanitary Institute in Calgary, the distance to Winnipeg being too great for associate members to travel to secure certificates by passing the examinations. He hoped soon to have an examining board in his centre.

Mr. Glover, of Kamloops, urged on the Association the advisability of trying to induce all municipalities to pass by-laws requiring every sanitary inspector to have special training and hold certificates of competency in sanitary knowledge.

Election of Officers.

E. W. J. Hague, assistant chief health inspector of the city of Winnipeg, was elected to the presidency again; Alex. Officer, inspector of tenements for Winnipeg, was re-elected secretary-treasurer, and W. F. Thornley, smoke inspector for

Winnipeg, was elected to the vice-presidency for Manitoba, succeeding P. B. Tustin, who went on the executive. The vice-presidents for the other branches of the association were elected as follows: Western Ontario, W. E. Stanley, Fort William; Saskatchewan, Thomas Watson, Regina; Alberta, J. J. Dunn, Calgary; British Columbia, F. L. Glover, Kamloops. The executive will consist of W. J. T. Watt, Douglas Little, P. B. Tustin and E. C. Brown, all of the Winnipeg Health Department.

It was decided to ask Sir R. L. Borden to become vice-patron of the Association in place of the late Lord Stratheona. The time and place of the next meeting will be decided by the executive.

As there are some ladies engaged in health work in Winnipeg and elsewhere in the West, it was suggested by P. B.



ALEX. OFFICER, Winnipeg.

Re-elected secretary-treasurer of the Sanitary Inspectors' Association of Western Canada.

Tustin, in reply to A. G. Warr, that the constitution be amended to permit of qualified nurses and school teachers being admitted to full membership. The executive will take the necessary steps to provide for it.

Delegates Present.

The following were present:—A. G. Warr, Prince Albert, Sask.; Thomas Watson, Regina; Paul McElmoyle, Regina; Ernest Hague, Alex. Officer, D. Braszchuk, Douglas Little, David D. Milne, Joseph Miller, Wm. F. Thornley, P. B. Tustin, A. F. Cumming, G. R. Mines, A. W. Foote, W. H. Rason, H. S. Sturgess, George Hanby, E. Saville, J. Foggie, B. C. Brough, R. McQuillan, M. Agranovich, Alfred Paull, C. S. Douglass, W. L. Martin, Max Mains, Herbert Moors, all of Winnipeg; I. Martin, Regina; T. B. Hetherington, Saskatoon; Joseph H. Jones, St. James;

W. E. Stanley, Fort William; A. F. S. Allan, Weyburn, Sask.; E. C. Davies, Medicine Hat; Walter Barugh, Transcona, Man.; H. G. Pickard, Brandon; J. I. Parkin, Brandon, and H. J. T. Watt, Winnipeg.

WESTERN NOTES.

East is West.

The secretary of the Institute of Sanitary Engineers has received an application for membership from a Montreal plumbing inspector. He was formerly stationed in Edmonton. This is hoped by some to be an indication of the East and West coming together.

New Roof Terminal Here.

The first job in which the new roof terminal recommended by the Institute of Sanitary Engineers at their annual convention at Edmonton was used, was passed by a Winnipeg inspector on July 22. This roof terminal is now on the market, and is being manufactured by the Anthes Foundry Co. at their Winnipeg plant.

Beware of Stenographers!

The report of proceedings of the Institute of Sanitary Engineers at their convention held at Edmonton in May has been completed, and sent to the executive for correction. The stenographer who was engaged to make the report, and who, after being paid, left with reports of committees in his possession, has not been heard of since, having gone to the States. The Institute has learned a lesson in shorthand it will never forget.

Winnipeg an Adjunct?

The secretary of the American Society of Inspectors of Plumbing and Sanitary Engineers has written James Smith, chief plumbing inspector of Winnipeg, inviting him to attend their annual meeting at Minneapolis, Minn., August 25 to 27 inclusive. After stating that efforts will be made to enact a National Plumbing Law, he adds: "As the establishment of such a code might have direct bearing in the plumbing laws of your locality, it is necessary for you to make an effort to attend." Oh!

Winnipeg Flood.

Floods in north-west Winnipeg kept the inspectors a-hopping during Exhibition week. Five inches of water fell in a few hours. It took 48 hours with sewers running full tilt to take the water away. It was standing above the man-holes in the street 24 hours after rain had ceased to fall.

More Bosses.

As a result of a plumbers' strike in Winnipeg a large number of new master plumbers' licenses have been issued.

The Progress of the Sanitary Engineer

Showing What Sanitary Engineers Have Done Along the Lines of Progress—That While Other Lines Have Developed Considerably, None Can Claim the Importance of Their Calling to Parallel That of the Work of Sanitary Engineering.

(By Professor Arthur Bateman, director, Anglo-American Sanitary Correspondence College, Chicago.)

HOW many of us realize that the wonderful progress made in the world has been entirely due to education, and the consequent enlightenment and efficiency of the industrial workers?

Turn back the pages of history and picture the Egyptians building the pyramids without the aid of a single mechanical appliance. Note the colossal number of slaves carrying and depositing the baskets of earth which enabled them to haul the huge masses of stone into position.

Can you imagine the vile conditions under which the industrial worker labored in the dark ages, before education removed the scales from the eyes of the masses?

Let our thoughts wander back to the times commonly spoken of as "the good old days," and watch the army fighting with bow and arrow, or, as a soldier uncle of mine once informed me, the enemy fought with bladders and sticks.

What would these people think of our present educational curriculum, our automobiles, aeroplanes, color printing, motion pictures, wireless telegraphy, drainage systems, foodstuffs, heating, ventilation, lighting, sewerage systems, garbage systems, sanitary appliances, and countless items which could fill ten or more volumes.

Yes, education has wrought many changes and wonders, and even our own reminiscences of sanitation are repulsive to us, yet it is some consolation to know that our ancient craft and profession has advanced at a quicker rate than any other profession or industry in existence. Nevertheless, there must be no procrastination in the younger generation, for we are far from being infallible, and have countless stupendous propositions ahead of us which only diligent study and tireless attention to our work can overcome.

Crude sanitation served its purpose in the medieval ages, but the population was sparse, and it answered the purpose, yet as the population increased, sickness and epidemics arose through no organized system of sanitation, and inadequate knowledge of the work.

Some 250 years ago the last severe plague raged in London, England, and then the great fire occurred which swept it away, thus out of evil cometh good,

and London was rebuilt on better sanitary principles.

What may be cited as the world's first great sanitary movement occurred when the late King Edward VII. of Great Britain was Prince of Wales, and a young man. Through defective plumbing he contracted typhoid fever, and, while laying on his sick bed, announced the fact that had he not been born a Prince, he certainly would have been a plumber.



Professor Arthur Bateman.

This statement made the public realize that our work is an absolute necessity to the civilized man, and is virtually universal. The house, the office, the institution, the factory, the warehouse, the cottage, the railway, the ship, not one of them can exist in proper fitness for human use without the plumber, but if our work is not carried out perfectly, it is simply an elaborate machine for introducing disease into our homes.

What a thought and responsibility to know the future health of the entire universe depends on our collective efforts.

We are differentiated from most other workers in the building trade by the definite fact that our occupation is directly scientific, and if we desire to make any real progress in the future we must become technical experts as well

as skilled mechanics. Very often the bulk of our scientific work is located where no one can easily follow us, and we must first receive a thorough education in this science, then apply the knowledge practically, faithfully and conscientiously so that the many diseases contracted through inadequate knowledge of sanitation, together with slipshod work, may be mitigated and finally abolished, so the lives of millions will be saved.

It is an acknowledged fact that some men commenced their careers with little or no education, and by sheer outstanding ability have successfully reached the top rung of their particular vocation. However, such cases are rare and modern requirements of life tend to make them more rare in the future.

The educational authorities have in the past deplorably underestimated the value of technical education, but are beginning to realize that education practically applied is the only means of raising the standard of the industrial workers, and the most vital branch of this work producing the most beneficial results to civilization and the health of the community is plumbing and sanitation.

It is well-known that diseases are preventable, and we must stand shoulder to shoulder and make such advancement as will eliminate entirely such diseases, always remembering the motto "Prevention is better than cure." In China, a payment of an annual sum is made to doctors for their services, and should illness occur during the year the amount payable is reduced according to the severity of the illness, thus doctors are paid for keeping their patients well.

Unfortunately, some employers undertake our work and regard it as a mere medium for profit and do not treat it for a single moment as a skilled handicraft and technical industry, in which the proficiency of the worker and not the profit of the employer is a governing factor, but this type of ignoramus can be treated with absolute contempt by the fraternity, knowing as we do that modern enlightenment on the part of the public will eliminate him entirely.

At the present time we are afforded educational facilities unheard of by our fathers, and although our work has in-

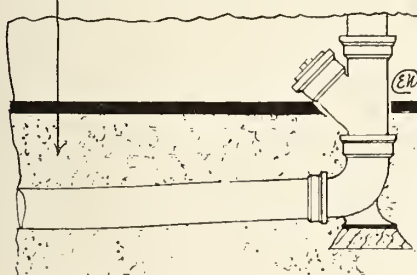
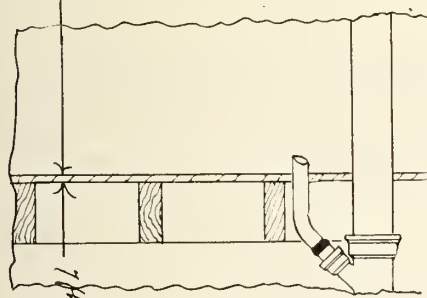
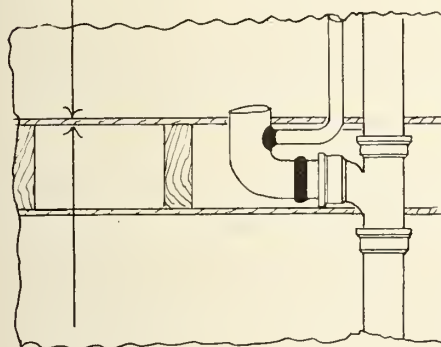
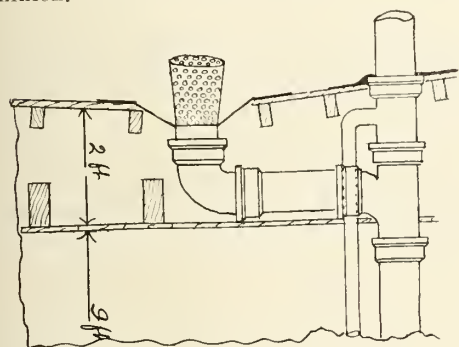
(Continued on page 22.)

Analysis of Can. Sanitary Engineering Bylaws

Continuing the Above Series We Are Again Taking Up the Plumbing By-Law in Force in Fort William, Ontario Known as By-Law 1181 With Amendments.

IN again taking up this series of articles we will resume discussion of the by-law at present in vogue in the city of Fort William.

We understand, however, that there is a general feeling throughout the trade that a uniform by-law should be adopted. Such a step will no doubt be taken in the near future. Several towns and cities are considering such a move, particularly in the western part of the Dominion.



The last article printed, dealing with the subject, dealt with the first 8 clauses. We will therefore take up clause 9.

Clause 9.

This clause deals with the cellar drainage and states how the seepage or subsoil water shall be taken care of. It reads as follows:—

Each cellar or basement shall be drained into a four-inch cast iron running trap with hub connections, fitted with grating to take floor drainage, seepage or subsoil water to be drained into end of said trap under floor, properly protected with broken stones or brickbats.

Provision shall be made for keeping the trap sealed in case of evaporation. The water collected in boiler-pits or catch-basins shall be discharged into the drain, through deep seal traps of cast iron.

One portion of this clause certainly draws our attention to one thing which is scarcely ever mentioned in any other by-law of this nature, and that is where "provision shall be made for keeping the trap sealed in case of evaporation." How many cases are there where such provision is made? We venture to state that during dry seasons there are more traps without water seals in them than otherwise. In winter time as well, when there is little moisture passing through the weeping tiles, and when cellar floors are kept dry, these trap seals are bound to be broken. In our last issue we suggested an idea which showed how the seals in the cellar drain trap could be protected by allowing the laundry tubs to drain into the said trap.

Clause 10.

This clause is general and deals with the rain water conductors, stating that

All rain water conductors within the walls of a building shall be of cast iron with lead caulked joints. Those outside shall be of cast iron for at least five feet above the ground surface.

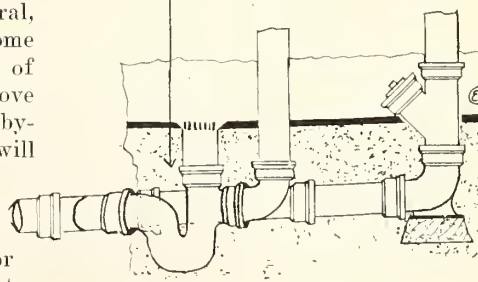
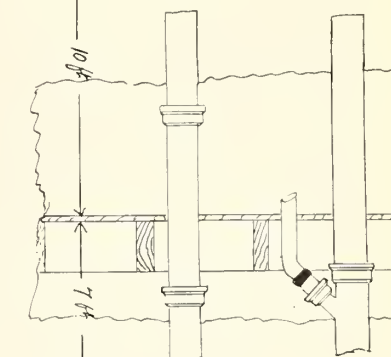
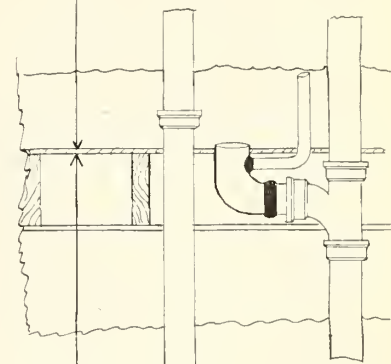
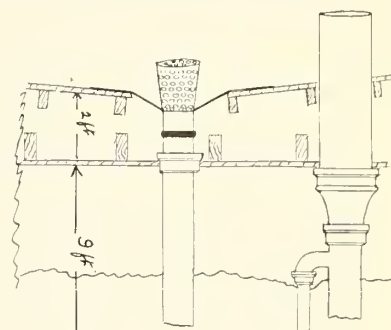
Clause 11.

This clause, too, is fairly general, though not in accordance with some practices carried out in other parts of the country, which further goes to prove the necessity of a uniform set of by-laws where climatic conditions will allow. We reprint clause 11.

No rain water conductor shall be used as a soil pipe, waste, or vent pipe, or vice-versa. No refrigerator waste, drinking fountain, exhaust

steam, or overflow pipe from any fixture shall be directly connected with any soil pipe, waste or sewer connection, but shall discharge openly into a sink or other fixtures or floor trap.

Now, as we stated before, we feel there is some slight objection to this clause in the first paragraph, where it states that "No rain water conductor (Continued on page 20.)"



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TORONTO, AUGUST 1, 1914

A YEAR OF CONVENTIONS.

IT seems at least that almost every branch of the sanitary and heating profession is beginning to waken up. First convention this year was that of the Ontario Provincial Society of Domestic Sanitary and Heating Engineers, during which event the society brought forth some very interesting reports. They took up the apprenticeship system. Technical education was discussed, and some very fine plans adopted. They pointed out the various districts throughout Ontario which had plumbing by-laws, and where there were none. They furnished a list of places where plumbing was inspected, whether or not the inspection was being done by practical men.

Next came the convention of the Canadian Institute of Sanitary Engineers. The officers of this institute brought up some splendid reports. They took up the necessity of a uniform plumbing code of by-laws for the whole of the Dominion. They solved the pipe terminal question, by submitting the results of various practical experiments. They also made some very valuable suggestions regarding the standardization of soil pipes and fittings, and several other topics of interest to the trade in the western provinces were discussed and decisions arrived at.

Then came along the Canadian Society of Domestic Sanitary and Heating Engineers with their convention. This body was the first to be inaugurated some years ago, and we believe is in reality the parent body of them all. At this convention several very vital subjects were discussed. They voiced the need of a uniform code of by-laws governing plumbing, they denounced the evils of bulk contracting and went so far as to form a delegation which presented a petition to the Minister of Public Works. They were very cordially received and the minister promised that their grievance should be taken up and given very careful consideration.

The latest convention to take place is the one of which we are giving a full report in this issue—The Sanitary Inspectors of Western Canada. This body has done great work during the last year, they not only discussed matters of sanitary engineering construction, but also every phase of sanitation and sanitary problems. Their members comprise medical men, nurses, sanitary inspectors, plumbing inspectors, milk and food inspectors.

They have been holding weekly meetings every Saturday, and have discussed every possible topic of interest to each and all. They one and all endorse the need of appointing none but practical men to fill the positions of either sanitary inspectors, or plumbing inspectors, we cannot picture a more deplorable condition than that of placing an impractical man in a position which he has no

knowledge of, and particularly that of either sanitary inspectors or plumbing inspectors. These men are as it were the custodians of our health and yet we have had all classes of misfits acting as inspectors.

However, it can be plainly seen that things are looking up in every line of our calling and in the near future we feel there will be more of the professional spirit among those engaged in this line, than ever before.



AN EPOCH-MAKING YEAR.

BESIDES all the work done by the various organized bodies, it is very encouraging to note the great amount of work done by civil engineers, along the lines of sanitation, quite a number of towns have installed sewage disposal plants. Water supplies have been given more attention this year so far, than in any other year in the history of the country.

Heating and ventilation have been taken up more than ever and before very long we hope to see the various boards of health take up this problem.

Quite a large number of small towns have adopted some form of plumbing by-laws, other towns have amended their present by-laws, so as to keep them more up-to-date, and several practical men have been appointed plumbing inspectors to take the place of men who were not practical.



PRACTICAL MEN ON HEALTH BOARDS.

ANOTHER very important matter has been taken up and in many districts adopted, that of having practical men appointed as members of the boards of health. This matter has been discussed by every body of sanitary engineers. One of our Canadian cities has not only appointed a practical man upon its health board, but it has organized an engineering department of the board of health.

In matters of sanitary engineering this department is pre-eminent and has power to adopt any measure which can be proved to be of vital importance without having to go to council for every move it makes. This is a splendid step, we feel that at last the boards of health are to take more notice of sanitary engineering. It was never anything else but the department of engineering of the board of health, who should be the first to be consulted when a building is being erected. We maintain it should be the board of health. Medical men are interested in town-planning as much or more than any other class, and with

them at their right hand are sanitary engineers. If boards of health and their engineering department had been consulted when permits for apartment houses were being asked for, we venture to state that many of the latter would never have been built. The apartment house of to-day is an abortion, and not fit for human habitation, look at them which ever way we may. They are simply built for speculative purposes, at the cost of humanity, and we are looking forward at this day to see less of them built. The scheme of town planning will solve a lot of the trouble re the housing problem. Then and only then will the work of sanitary engineers give 100 per cent. results.

The sanitary inspectors of Western Canada voiced the subject of submitting to the board of health all plans for new building, before a permit be issued, and Sanitary Engineer endorsed such a move. It is a move in the right direction, and we sincerely hope such a measure will soon be adopted by every municipality. It is a scandal to see good money being spent and lives being jeopardized as is being done at present, all for the sake of accumulating mere filthy lucre. It cannot help but be filthy when gotten by such practices as building insanitary buildings, crowding humanity like sardines and generally polluting the whole city.

But once let it become law that a residence shall have so much vacant area round it, once have it law that all plans be submitted to the boards of health, before allowing the buildings to be built, and we may soon look forward to more congenial surroundings, fewer apartment houses (sardine boxes), less tuberculosis, greater vitality and a stronger race.



SANITATION IN SUMMER RESORTS.

IT has long been a tradition, and it may perhaps be something more, that Toronto's typhoid record has been made much worse than it should have been by citizens contracting the disease at insanitary summer resorts and bringing it home with them to develop. It is safe to assume that no popular summer resort is as well fixed sanitariously as it should be, that in many of them the arrangements for disposing of garbage and other refuse are primitive and crude, that in some of them wells are liable to be infected by the percolation of impure water, and that small lakes have in many cases become continuously if not permanently polluted by filth from both the steamers and the cottages.

Heretofore the yearly inspections of summer resorts by officials of the Provincial Board of Health have been admittedly perfunctory, but this year there is to be a change so far as the Laurentian district resorts are concerned. Those around the Muskoka Lakes are specially mentioned in this connection, probably not because they are specially dangerous, but because their summer population is very large. Whatever may be practicable to accomplish this year, the attention of the Provincial health authorities cannot too soon or too closely be directed to the string of summer resorts along the shore of Lake Ontario, and especially those between Hamilton and Toronto. Some of them are now quite crowded, and are every year becoming more so. Burlington Beach, Lorne Park, and Long Branch have been used as summer resorts for many years, but they have of late been growing rapidly in popularity, and before another season begins they should all be placed under some form of community organization that would enable the health authorities to enforce their requirements by means of local administrative corporations, capable of being penalized for non-performance of public duties.

The foregoing is a reprint from one of the daily newspapers, and one which we thought to be of special interest to sanitary engineers.

Some time ago we stated in the Sanitary Engineer that there was and is a field in the country town for new business for sanitary engineers. No one appreciates comfort more than the residents in a rural district and by reading the above there is proof enough that sanitary engineers could find lots of business out of the city. One thing which should be guarded against when tendering on such work, is that of price cutting.

Whatever work sanitary engineers do in the country, should be first-class work, and the very best material and fixtures only should be used, because of the long distance the occupants of a country residence would have to travel for repairs.

Here is another chance for the craftsman to do a little towards educating the people. He would be able to earn a reputation for himself. No body of people, would better appreciate a like education along lines of sanitation than those who live in isolated districts.



ADVERTISING AND THE TRAVELER.

It is a bad thing all around when a traveling salesman has no conception of the value of advertising; particularly is it a bad thing for the house he represents. Sometimes travelers are keenly alive to the advantages of advertising and take full advantage of the publicity work done by their firm; quite as frequently, however, they make no effort to work in co-operation with the advertising campaign.

In the course of an article in Printers' Ink on "Advertising as the Salesman's Assistant," O. C. Horn of the National Lead Co., tells a story that is particularly apt in this connection. He says:

A young man, whom many of Printers' Ink's readers know well, was traveling for a company in the Middle West. One day he went to the president of the company, and said: "I'm not getting any more money than I should, and yet I'm costing the house too much."

This rather startled the boss, who replied, "Let's hear how."

"Well," explained the salesman, "I have been keeping some records and I find that I spend two-thirds of my time explaining to my prospects who I am, who my house is, and that our products are really worth hearing about. It takes me too long to prepare the way for my real business, closing the deal—getting the order."

The president understood, for it was a new company and he realized that the trade did not know the house or its goods.

"Have you a remedy?" he asked.

"Yes, do my preliminary work for me by telling all this story about who we are in the trade papers. Make them familiar with our name and the lines we make. Give them in a general way what our claims are."

The salesman's advice was followed and not only he but all the salesmen of the company found their efficiency increased many fold. Thereafter they could cut out many of the preliminaries and plunge into the essentials. They could dispense with generalities and get down to particulars. All to their own gratification and the profit of the house.

This is my idea of the relation between salesmanship and advertising in most businesses I know about.

ANALYSIS OF CAN. SANITARY ENGINEERING BY-LAWS.

(Continued from page 17.)

shall be used as a soil pipe, or vice versa."

In Fig. 1 we show what is being done and has been found to give satisfaction. To date we have not heard of any objections to the practice, and we, as sanitary engineers, must study more than one side of the question. We must not only consider the various problems of sanitary engineering from a sanitary standpoint, but also from a financial aspect. This clause would require any person who built a house with a hopper roof to run a separate rain water conductor pipe from the roof to the level of the house drain. The cost would be a pure waste of money. Fig. 2 shows what this clause would demand. We do not see any objection whatever to adopting Fig. 1 for a single or even a double house where there is only one bathroom and one W.C., both situated on the same level.

The method shown in Fig. 2 is adopted in Ottawa and several other cities and has not been found to be in any way objectionable, and at the same time is much more economical. When running a separate rain water leader from a hopper roof, it has been found to run to a point in the basement ceiling which was on the way of other piping, and often too close to the floor drain trap. Though we show the bend at the foot of the rain water leader, entering the trap, it would not be advisable to have it quite so close in actual practice. We simply show the two methods so as to show the simplicity of Fig. 2 as compared with Fig. 1.

We will be only too pleased to learn of any objections which may be quite justifiable under certain conditions.

Clause 12.

This is general, and simply states that "Buildings having gutters, or spouting for roof water with conductors, and wanting to connect with sewer, shall discharge into deep seal traps inside of basement wall, before entering drain or sewer and to be at all times accessible.

Clause 13.

Vent pipes must have a continuous slope to avoid water collecting by condensation. No chimney flue shall be used as a sewer or drain ventilator.

Clause 13, of course, refers to trap and W.C. venting. It does not mean that local vents may not be connected to a flue or chimney, as the latter is far more desirable for local ventilation than running local vents to the outside, unless, of course, there is a coil or some other heat supplied to induce a draft.

Clause 14.

All rooms in which water closets are placed must be ventilated by window or ventilator opening to the external air and entirely enclosed, and no water closets shall be allowed in basement unless light and ventilation is provided to the satisfaction of the medical officer of health or the plumbing inspector. Basement closets to be local vented.

Now, the first portion of this clause can easily give rise to criticism, its meaning not being quite clear, while the latter seems to meet all requirements and is more specific. For instance, let us cite the first part. It states: "All rooms in which W.C.'s are placed must be ventilated by window, or ventilator opening to the external air and entirely enclosed. Such would lead one to think that if a local vent was fitted up it would act as an alternative for a window; but we scarcely think that such is the case. We cannot for one moment imagine any city allowing a W.C. being placed in a room which is not directly connected with the outside air. In fact, we would not allow even a light shaft to be construed as being connected to the outside air, and would not allow a light shaft to be used for the purpose of supplying openings into bathrooms or lavatories. Regarding local ventilation, we think it is carried out too far in many cases. If the subject of local ventilation were given a little more study, a lot of it would be dispensed with in a very short space of time.

Clause 15.

This clause has been amended and made to mean more than the old clause. The new clause 15 reads as follows:—

Water closets shall in no case be flushed directly from water supply pipes, but shall be provided with a separate cistern or flushing tank, with not less than three gallons capacity, with ball cock service capable of withstanding one hundred pounds pressure to the square inch, or approved flushometers. Closets must be so constructed as to be fully flushed at each discharge.

Connections must not be made into closet bends, unless approved of by inspectors. Pan plug or valve closets are prohibited.

The connection between the closet bowl and the lead bend shall be made by bolting the closet flange to a heavy cast brass floor plate, the lead of the closet bend to be flanged over floor plate, and the joint made gas and water tight by means of linseed oil putty, and the base of the bowl to be well bedded in same, so that any insanitary matter may not lodge between the base of the bowl

and floor, the floor plate and floor under base of bowl, also base of bowl to be painted before oil putty is applied. In the case of marble or tile floors, the joint may be made gas and water tight by means of a grommet of red and white lead, and space which is filled up with plaster of Paris. Also all joints on the sewer side of an installation of traps or vents shall be either screwed, ground, or wiped joints, and all vents of S traps shall be in line with the vertical of wastes. Also in case of testing out drains, before "roughing-in" work is installed at least a five foot head of water is called for.

Upon installation of fixtures, inspection is called for on new installations, alterations, or additions, before the mechanic leaves the job.

Only allow vents to be wiped on, if there is no room for a fitting to be installed.

In reading over the first part of clause 15, one cannot but be impressed with two things: the first is where it calls for ball-cocks to work against a pressure of one hundred pounds. The very fact of this being required, goes to prove that Fort William officials in compiling their by-laws did all in their power to prevent waste of water as much as they could. It is quite evident they know the cost of pumping water, and also that the cheap ball-cock causes more waste than any other domestic fixture we know of. The next practical feature in this clause is that where it specifies how the putty joint must be made between the W.C. bowl and the floor. Although it does not state that the lead shall be soldered to the brass flange, we hope it is demanded. It does state that the base of the bowl shall be painted. The writer has taken up many a bowl and found that the putty had not adhered to the bowl, therefore not actually making a joint at all. If the wood floor were given a coat of white lead paint and allowed to dry, then the base of the bowl given a coat as well, no doubt a far more satisfactory job would be the result.

Clause 16 **.

In schools, factories or public buildings, a group of closets on the trough system supplied from one flush tank system may be permitted, provided the flush is by automatic action, of sufficient volume, and regulated to discharge frequently. In such buildings separate accommodations to be provided for the sexes, and not less than one seat to every forty persons.

**Although not cut out of the by-law, this is obsolete as far as installations are concerned, and the trough system has not been installed

(Continued on page 24.)

Toronto Society Hold Their Annual Picnic

Most Successful Gathering in the History of the Association—Manufacturers and Supplymen Were Well Represented—Exciting Baseball Game Played Off Between Manufacturers and Sanitary Engineers.



Group photo of Toronto Domestic Sanitary and Heating Engineers at their annual picnic.

ONE of the most successful and enjoyable picnics ever held by the Toronto Society of Domestic and Sanitary and Heating Engineers took place on Tuesday, July 14, at Island Park. The boats left the city sharp at 1 p.m., and the fun began. In spite of hard times the whole society turned out in good form to enjoy the day. The entertainment committee had prepared a splendid programme which went off in fine style.

Baseball Game.

The baseball game was "some game." The manufacturers had not forgotten the beating they got at the convention in Ottawa, when Blyth swore it was worse than any corner of Mexico, when he was

umpiring the game. This time, however, the sanitary engineers got it in the neck. We heard that the manufacturers had been in secret training for the fray. Talk about pitching. Well, Yeates certainly pitched alright. Had it not been for Dave Menzie, the S. E. catcher, it would have been a case of "baying ball" instead of "playing ball." Peter Mac-michael, too, certainly umpired the game alright. He made Geo. Clapperton run round the bases about three times before he was satisfied and Geo. can certainly run. Even though the results were against the "pipe menders," it did them good to let the manufacturers win for once. But you can bet the mfrs. have tasted blood, and it will take the S. E.'s

all their time to hold up their end in any future engagement.

The final score stood at:

								R		H		E
0	0	0	1	0	0	0	—	1	—	5	—	4
2	1	0	3	0	4	0	—	10	—	12	—	2

The weather man turned on the "damp wetness." It kind of put the plug into the enthusiasm for a while. However, Jack Fullerton came along and suggested that dinner should take place a little earlier. It had previously been arranged to have dinner at 6 p.m., but when the weatherman butted in a change was made, and the dinner was put under cover a half an hour earlier. Well, everybody enjoyed themselves at the dinner except a few who



Ladies and guests of the Toronto Society of Domestic Sanitary and Heating Engineers at the annual picnic, with Alderman Ryding as center of attraction.

could not come before dinner, and they just arrived in time to see the dinner doing the vanishing stunt in great style. They did not figure on Jack Fullerton changing the programme. But here he was again ready to see that the late comers got all they wanted. Well, after dinner there were quite a lot of races run off; in fact, the speed developed by those who took part in the fat man's race was something terrific, and pretty nearly ended like a scrimmage at a rugby football match. Cluff and Ryding got twisted together and there was some fear that a by-election would be the result in the city. Waterman got so excited that he tried to slip out of sight through the megaphone. The whole event was rather slippery on account of the wetness of the grass.

The letter race was one of the most enjoyable events of the whole time. There was a certain amount of mystery connected with this race and to see the way the ladies and gentlemen scrambled for their partners was a sight for sore eyes. If the human race were to take half the interest in looking for life partners, we venture to say that bachelors and elderly maidens would be non-existent, and the suffragette a thing unknown. To crown all, after they had found their partners they put up "some race"; it was almost

"inhuman." Tom Longboat wasn't in it, never.

The kiddies, too, had a chance to show their skill in running and it was fine to see the tiny tots race across the field. Of course they were all rewarded with splendid prizes. The children look forward to this picnic as the event of the year, and all present became children. From staid Peter McMichael to Geo. Clapperton, all were children. Anyone trying to get in a word of shop talk was severely left alone. Of course, the plumbing inspectors had to be in on the job. They always are, when the sanitary engineers have anything doing, except that in this case they got on the job a little quicker than they do on some other occasions. What is more, they stayed on the job so long that Meadows, their chief, became a little alarmed that some very serious work was being put over his men, and he had to finally come in on the inspection.

The tug-o'-war was some tug. John Wright was the boss of the sanitary engineers in this event, and he led his men on to victory in fine style. The manufacturers tried to put one over on the sanitary engineers, when they dug their heels into mother earth so as to get a foothold. But John would not let his men do any such thing, so when the

parties changed ends the engineers fell into the holes made for them, again pulling the manufacturers all over. It was "some tug, you bet," ending in a win for both sides, to be pulled off next year, D. V.

However, after getting rounded up, the whole party had their photos taken and went on their homeward way rejoicing.



PROGRESS OF THE SANITARY ENGINEER.

(Continued from page 16.)

creased in quantity and complexity and our responsibilities have increased proportionally, there are opportunities existing which, if seized, will ensure the advancement of our trade and profession at even a quicker rate than the past fifty years.

Let us remember what education has already accomplished for every industrial worker, also the huge responsibilities we have had thrust upon our shoulders, and strive to imbibe the feeling that we are in this craft and profession that the world will be made better for us having been in it.



1. Sanitary Engineers team; 2. Manufacturers and Supplymen's team; 3. D. Menzie, S.E., catcher; 4. Geo. Clapperton, the Sanitary Engineer's champion; 5. P. McMichael the Manufacturers' champion; 6. tug of war between Manufacturers and Sanitary Engineers.

Practical Problems for Sheet Metal Workers

How to Develop Chimney Caps

By E. Bronson

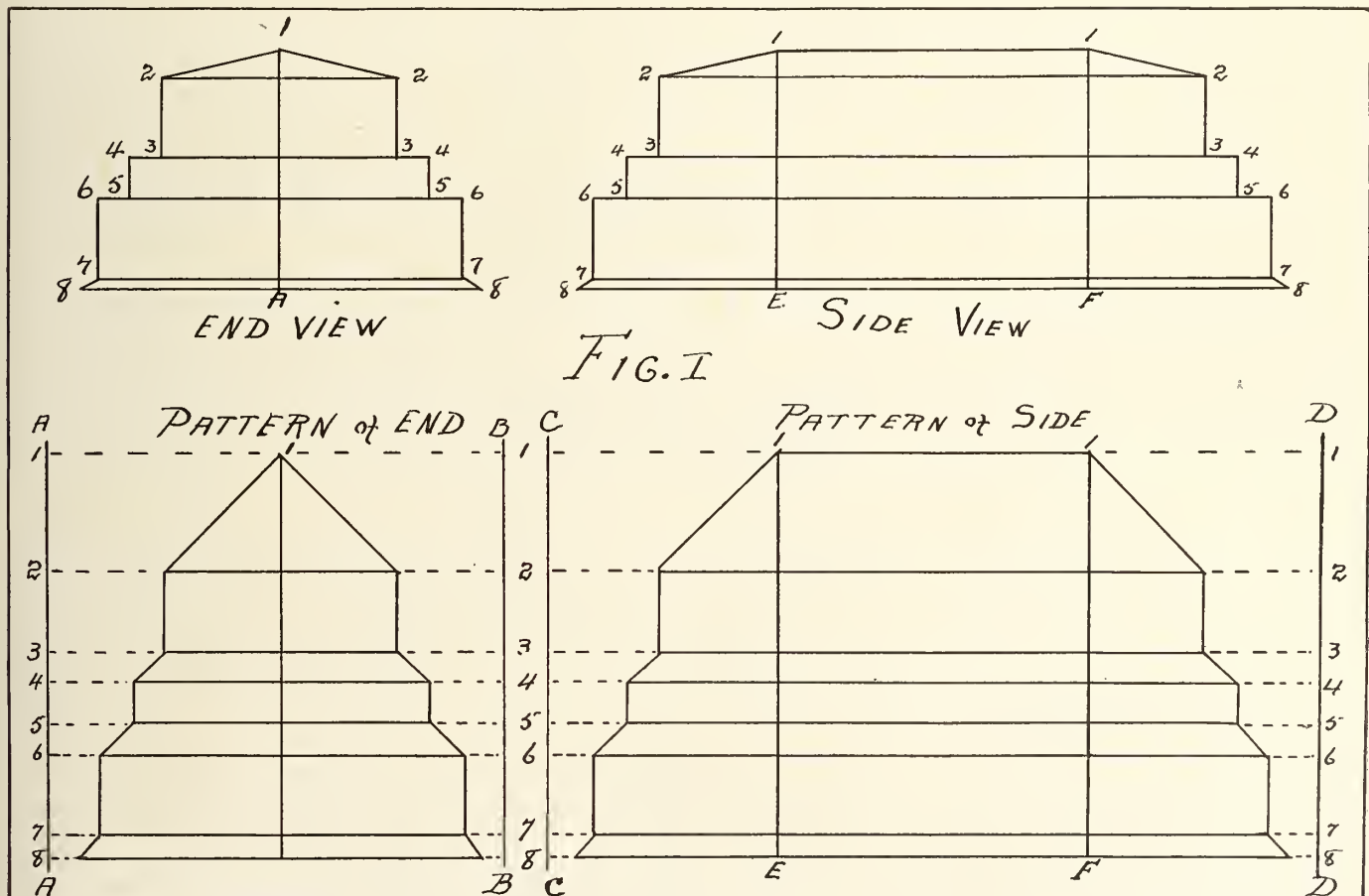
IN this problem is shown how to develop a chimney cap. In many instances, the action of the weather, combined with gases, causes the top of the chimney to become unsafe. To prevent the action of the weather on the brickwork, a metal cap similar to that shown in Fig. 1 may be used to advantage. The outline or profile of the cap follows the outline of the brickwork, with the exception of the bottom member, which projects out from the chimney to throw the drips clear off the brickwork.

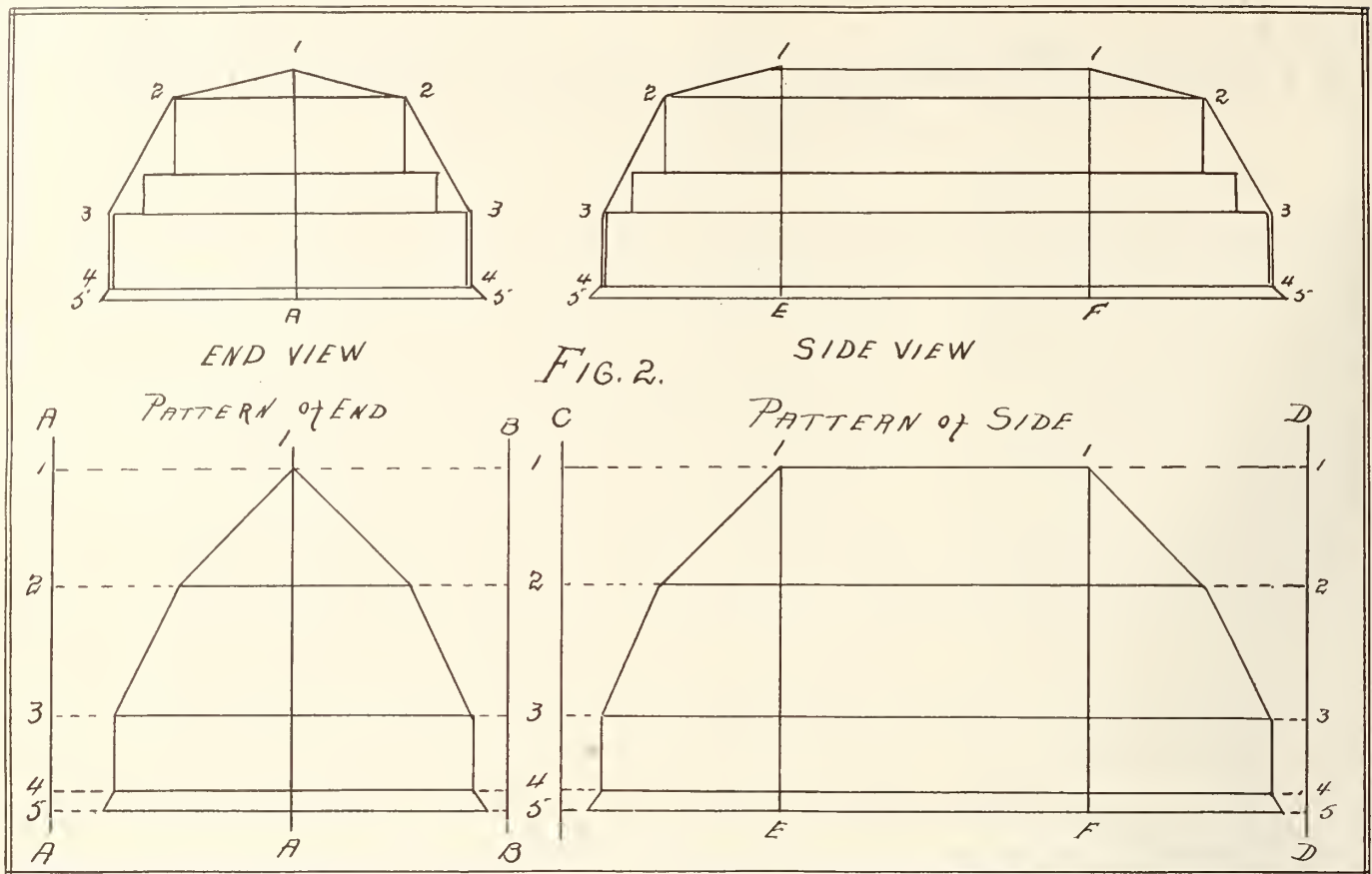
In Fig. 2, the outline of the cap is shown over the outline of the brickwork, but does not fit close to it, but is made with fewer braces or members. The dotted lines in the side view in each figure show the lines of the flues where they come through the cap. They are not shown on the patterns, as in most cases it is better to cut them out after, as the flues never come very even at the top, and collars can be fitted on after cap is made up.

Having obtained the size of chimney to be capped, draw end and side views as shown in upper part of Fig. 1. To obtain stretchout, space off from center at top to bottom on either side, as there are no round members or mouldings, each member can be taken as one space, as shown by figures 1-2-3-4-5-6-7-8. To lay out pattern of end, draw two stretchout lines a distance apart equal at least to the width of the end, as A-A and B-B. Draw a line at right angles to A-A, connecting it to B-B as at 1-1. From point 1 on each of the stretchout lines mark off spaces shown on side view, from 1 to 8. Draw lines from A to B connecting points 2 to 2, 3 to 3, 4 to 4, 5 to 5, 6 to 6, 7 to 7 and 8 to 8. On the end view draw a line in the center from top to bottom as shown by line 1-A. In the center of space between stretchout lines, draw a line as 1-A on pattern. Using these lines as a point from which to work from. In order to mark both sides of pattern without too much shifting, begin at A on end view. Measure the dis-

tance point 8, and mark off this distance on line 8-8 from point A on pattern. Measure off the distance of points 7-8-5-4-3-2-1- on line A to 1, and mark off in a similar manner from line A-1 on pattern, a line drawn through the points thus obtained will give you outline of pattern for the ends. To obtain pattern of sides draw two stretched lines, as C-C and D-D, and on these mark off the spaces shown on end view. On side view draw two lines as shown by 1-E and 1-F, on stretchout draw two lines as 1-E and 1-F the same distance apart as 1-E and 1-F on side view, using these lines as points to measure from. Begin at either 1-E or 1-F on side view and measure the distance to point 8, from either 1-E or 1-F, on pattern, mark off the distance thus obtained on line drawn from 8 to 8, and measure the other spaces, 7-6-5-4-3-2-1 in the same manner, and mark off on pattern. A line drawn through points obtained will give outline of pattern of sides.

The seams on the corners can be





either lapped and riveted, or the seams on upright faces or members double seamed and the level members lapped and soldered; by this method it is an easy matter to keep the cap square.

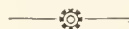
As the cap shown in Fig. 2 is practically the same, we have not detailed the method to follow in developing patterns. While as shown, the patterns are full size, it is not necessary to make them so in actual practice, as a pattern five or six feet long would mean a lot of unnecessary work for nothing. In this case all that is necessary is a part of side as bounded by stretchout line C-C and measuring line 1-E. With this part of the pattern, the sides can be marked off from a straight line formed by the bottom of the cap, as S-S. From this line draw a line at right angles, as 1-E. Lay pattern on two lines thus procured, and mark around with scratchawl or pencil. Lay off or measure the length of side required, and mark off the outline of pattern in a similar manner. Should the outline of the end and side of cap be the same on all its members, only one pattern, of course, need be developed.



New Brunswick Society Convention.

Members of the New Brunswick Society of Domestic, Sanitary and Heating Engineers held their annual meeting last week in St. Stephen, N.B., where quite a large gathering of them assembled. Many matters of interest to the trade were considered, including the matter of the appointment of practical plumbers on

boards of health. It was decided to petition the Government to insist in the future that all plumbing inspectors appointed should be practical plumbers. A committee was chosen to deal with the matter at the next session of the Legislature. Other matters of importance to the fraternity and in the general interests of sanitation were also considered. The visiting delegates were royally entertained by the St. Stephen members, who proved themselves most capable hosts. D. J. Shea, of Fredericton, was elected president; Wm. Watson, of Moncton, vice-president; and E. H. Hurley, of Fredericton, secretary-treasurer.



ANALYSIS OF CAN. SANITARY ENGINEERING BY-LAWS.

(Continued from page 20.)

in Fort William for several years past.

Referring to this by-law, we hope it will not only be obsolete, but also be altogether eliminated. There is not one commendable aspect in it. One good thing is that it has become obsolete by mutual consent. The portion where it allowed one seat to forty persons is bad, as there is nothing to prevent such buildings being allowed to install just one W.C. for each forty persons, and, if such be the case, we feel that it should be amended. Let us just reason the matter. In a school of 400 children there would only be five closets for each of the sexes, and of what use would such

a small number be. As these fixtures are mostly in use during recess time, the conditions would be very annoying. We think that more than that number should be provided, at least one W.C. to each 15 or 20 persons. Such rule would give a fair margin for factories and office buildings being built to-day, where such accommodation is very limited. If the employer would study this accommodation as one thing to create greater efficiency, he would provide more of these fixtures.

It is just another phase of our calling to which we sanitary engineers should give more attention. We should thus not only make more business for ourselves, but also show business men how to cater to the comforts and convenience of their employees and so reap a greater reward in efficiency from them.



New Pressed Radiator Catalogue.

The Pressed Metal Radiator Co., Ltd., Pittsburgh, Pa., are circulating a splendid booklet describing their "Presto" radiators. This book is also filled from cover to cover with useful information which should be in the possession of every heating engineer. One very handy feature is the roughing-in measurements necessary for the various styles and sizes of radiators. This book may be procured from the Pressed Metal Radiator Co., Pittsburgh, Pa., or from their Canadian agents, the Waldon Co., Ltd., Lumsden Buildings, Yonge Street, Toronto.

Domestic Hot Water Supply Problems

A Series of Articles Dealing With the Problem of Hot Water Supplies, Range Boiler Connections, in Several Forms and Methods Adopted as a Means of Heating Water Under Various Conditions.

Article 4.

IN our last issue we took up a very simple form of range connection dealing with method of taking measurements and kind of dies used, etc. In this issue we will take up one or two methods of piping of a little different kind and under different conditions. It is strange to note what small things will cause poor circulation. For instance, it has often been found that a water front has been tapped crooked, and then the fitter has made a straight thread, which has resulted in a trap being formed. Another cause of poor circulation is when a core has not been cleaned out properly, and the core sand has become loose and deposited in the lower pipe, partially blocking up same, as shown in Fig. 3.

We have often been asked how a range boiler should be connected when there has been a door or window between the boiler and space left for a range to stand, or, in many cases, if a boiler could be placed in a corner and the range on the other side of a door or window it would make the space left in the kitchen much more convenient. In Fig. 6 we show how this could be done.

The boiler would be better if raised about two feet from the floor; the piping should be well reamed and free from burrs. Use as few fittings as possible, there will be enough spring in them. If the upper pipe requires to be run to the corner or edge of the ceiling, the pipes should be offset by bending the pipe. Adopt the same method when the pipes are run from the wall to the range water front. The return piping should not be run one inch lower than is necessary. When taking the hot water supply from

the upper pipe it should be taken off as shown, and at that point. Be sure that the tee is 1 in. x $\frac{1}{2}$ in. x 1 in. if the supply of hot water is $\frac{1}{2}$ -inch, taking care that this point is the highest on the connection, and in that way taking care of

give all the water necessary, and at other times has had to add more heating surface to get the desired amount. In our next issue we will show how additions may be made, also various styles of coils made to fit ranges when it has been difficult to get water fronts.

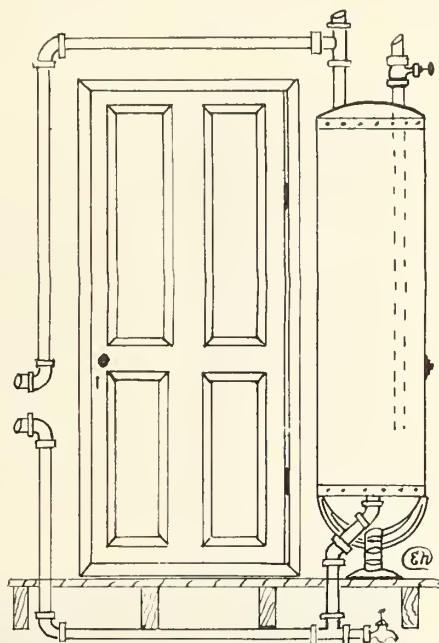


Fig. 6.

all air or steam which may accumulate.

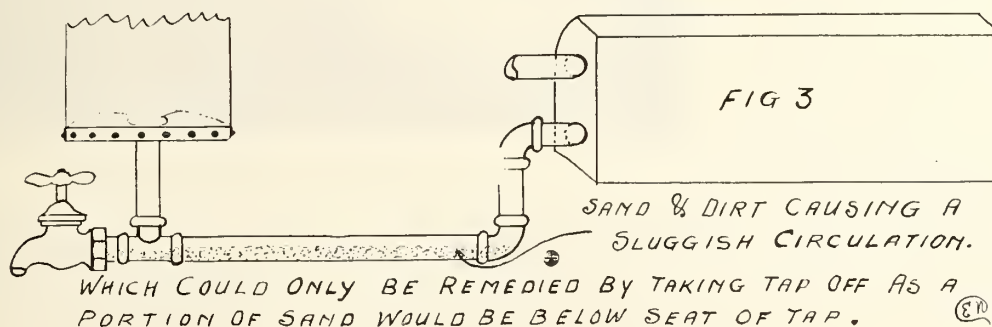
Of course, when making this connection, it should be pointed out that it will not give as much hot water as the more direct method of making connections, but will not give less than two-third-the quantity, and often when the water front is extra large, this connection gives all that is required. The writer has many a time found this connection to

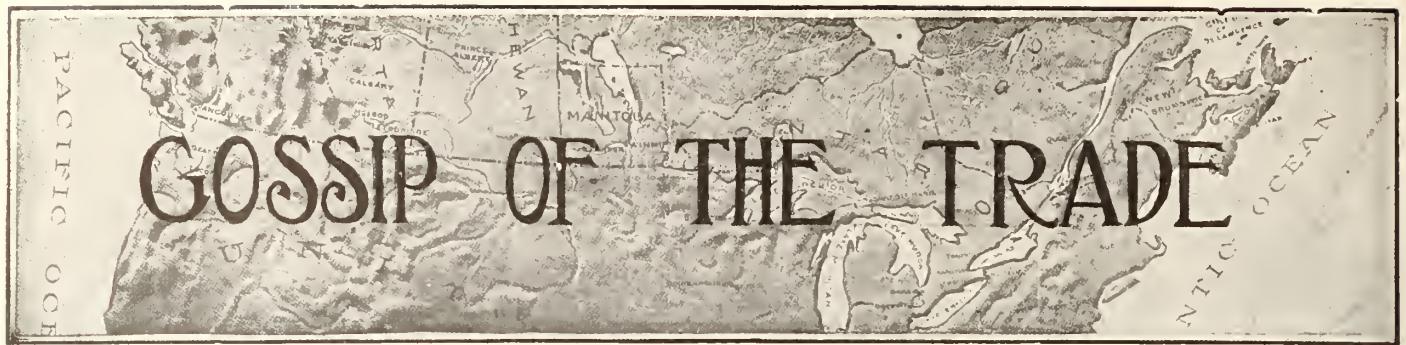
DEATH OF J. H. MEIR.

Members of the trade will regret to learn of the death of J. H. Meir, who, for about two years, has been calling upon the sanitary and heating engineers as subscription canvasser for Sanitary Engineer. He was always well received by one and all, and thought a lot of the craft as a whole. In speaking with the late Mr. Meir some time ago, he stated that it was a pleasure to call upon the trade, because he felt he was always received by all in a very cordial manner.

He was taken sick on Friday, July 17th, and was removed to the General Hospital, where he was operated upon. Death followed on Sunday. The funeral took place on Tuesday to Owen Sound, his old home, where for a long term of years he had been engaged in newspaper work.

Mr. Meir had been with the MacLean Publishing Co. about two years, being engaged in the subscription end. He proved a good solicitor, being particularly successful on certain of the papers. Although his work kept him out of the office for the most part, he had become well acquainted with all members of the staff, and was both well liked and respected by all.





Should Reduce Size of Soil Pipe, Says Mr. H. Nixon, of Saskatoon.

The trend of opinion amongst Canadian domestic, sanitary and heating engineers, as presented at their recent Dominion-wide convention at Ottawa, is towards a standard plumbing by-law for the whole Dominion of Canada, and in his opening address the president stated that one feature of great moment to attaining that end is the formation of a strong and enthusiastic institute. The Canadian Institute of Sanitary Engineers in the western provinces was established. He strongly advocated the organization of an eastern branch to work in conjunction.

The outstanding features of the work accomplished at the recent sanitary engineers' convention held at Edmonton were the partial standardization of pipes and fittings and plumbers' brass work generally, the elimination of the tin roof jack, for a safer and yet cheaper method of treating the terminals of vent pipes.

It was also decided to extend the welcome of the institute to the provincial health officer and secure his sympathy and co-operation.

The convention also went on record as favoring the examination and technical education of plumbers and the efficient inspecting of all plumbing installation throughout the province.

The committee on sizes of soil, waste and vent pipes were unable to bring in a report, presumably owing to the reduction of main soil pipes so strongly urged by the secretary of the Saskatoon delegation. Horace Nixon, who is chairman of the institute's publication committee. This reform would cheapen the installation of plumbing work, Mr. Nixon urged, without impairing the efficiency. He is now in communication with the professor of sanitation at the University of Illinois, who is conducting experiments along these lines, and has promised to try out his ideas, with which most of the local master plumbers are in sympathy, he says.

This will call for a little more skill and fullness on the part of the average

plumber, who will be greatly aided by the improved construction of the pipes and fittings that have been standardized.

Sanitary Inspection in B. C.

In pursuance of its policy to do everything possible to improve sanitation at all new settlements throughout the Province of British Columbia and points where frontier work is in progress, the Provincial Department of Public Health has despatched Mr. Frank DeGray, chief sanitary inspector, on a lengthy tour all along the Coast. Mr. DeGray is using a launch for the purpose, and is visiting all the logging camps and new settlements. He returned to Victoria recently for a brief visit to headquarters, and reports that he found conditions much improved as a result of the vigilance of the Government.

his favorite trade paper, The Sanitary Engineer, to have a look at the camera man. William Brayley has only been in Fort William six years, but in that time he has achieved a considerable reputation. He is one of those men who, by hard work and sterling ability, make good substantial businesses. West Fort William was mostly bush when he landed there, and, apart from one or two water services, he had little to do. After working as journeyman for eight weeks, he put out his own shingle. When that section of the city grew, the Brayley business grew too, and things looked so good, several other plumbers followed.

His first building was a shack, his capital almost nil, and his tools little more than a hammer, but it was not long before he was compelled to build larger premises, so that to-day he has an excellently equipped workshop and as neat



Office of William Brayley, sanitary and heating engineer, Fort William. Mr. Brayley is shown at the right.

Progressive Sanitary Engineer in Fort William.

The above cut shows the interior view of the office of William Brayley, of Fort William. Mr. Brayley can be seen at the right, and has just taken his eyes off

an office as one would find anywhere. Recently his business extended to the sister city of Port Arthur, where he has opened an office at 220 Algoma Street W. His work there includes the contract for the Cumberland Hotel, which

is work of a high order, and several minor contracts. In Fort William he has built up a splendid connection.

To a representative of The Sanitary Engineer, who called on him recently, he told an amusing story of a child who called him up on the phone early in the morning.

"Is that you, Mr. Plumber?" she asked. On finding she had the right number, she went on: "Mamma's busted upstairs."

He rushed over to the house, and found that a pipe leading to the bathroom had broken.

New Concerns.

Gough & Knibbs, a new concern, have opened an office at 1511 Brown Street, West Fort William. A. W. Gough was formerly with William Brayley, of the same city. P. Knibbs was with the Fort William Hardware Co. for two years, and prior to that worked for J. A. Caslake, Collingwood.

Skippen & Co. have started business at 126 Fredrica Street, West Fort William. A. K. Skippen was formerly with W. B. and H. R. Sime, Port Arthur.

The Standard Electric Co. have taken half the store of William Brayley, West Fort William.

Committee Favors More City Drinking Fountains in Winnipeg.

Drinking fountains should be installed in all parts of the city for the convenience of the citizens, the members of the fire, water and light committee stated recently at the regular meeting. They admitted there were not half enough of these, and it was a disgrace that a centre the size and importance of Winnipeg should not have more of them, and long ago.

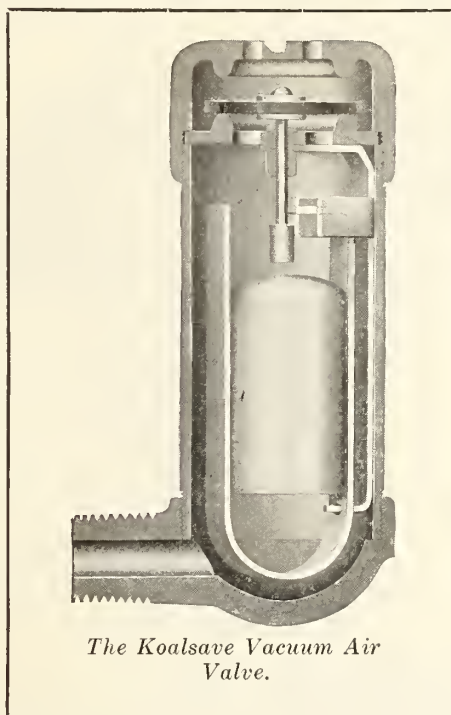
At the present time a few were scattered in different portions of the city, but it was almost impossible to find them when most wanted. In order to overcome this condition it was felt that action should be taken without delay providing for the installation of fountains in the most frequented districts. Similar drinking places for animals were suggested, and when the final steps are taken in connection with the matter, the members felt that the latter would be included in the plans.

There have been requests made frequently that these be installed where most needed, but the members believed that the entire city should be favored. Nothing definite was done with the suggestion at the session, but further action

along this line was promised in the immediate future. At all events each of the aldermen on the committee endorsed the suggestion advanced in this respect, and said they would do what they could to have them erected at the first opportunity.

The Koalsave Vacuum Air Valve.

The accompanying illustration shows a sectional view of the Koalsave vacuum air valve, which is now being introduced to the trade by the Koalsave Vacuum Valve Co., Park Row Building, New York City. This valve is attached like any air valve, works automatically and requires no adjusting whatever. In



describing it, the manufacturers state that the play between the shoulder of the valve disc stem and the hook on the thermostat-metal tongue allows free expulsion of air; upon entrance of steam into the valve the thermostat-metal tongue expands, entirely releasing the disc, whereupon the disc is forced to the upper or steam seat, holding all the steam in; upon lowering the steam pressure, the outside air forces the disc down to the lower or vacuum seat, keeping all the air out and forming and holding a vacuum. The manufacturers state, further, that it is packless, noiseless, leak-proof and fool-proof, and that with this valve on all radiators every radiator becomes hot almost instantly and the vacuum formed draws whatever steam there may be in the system directly to the radiators, thereby keeping them hot for hours after the fire has been banked and the pressure lowered. Parties inter-

ested in vacuum heating can obtain complete information from the above-named company upon request.

Killed by a Torch.

John Reid, 48 Arnold Street, Winnipeg, who was severely burned on July 22 by the explosion of a gasoline torch with which he was working, died the following morning.

Contracts Let.

Sudbury, Ont.—The contract for the heating and ventilation of the new Separate School has been awarded to the Sudbury Plumbing & Heating Co., the plumbing and wiring to J. R. Wainwright. The ventilation system will be thoroughly up-to-date, and the only one of its kind in the district. Both works will be completed within eight months.

Made License Compulsory.

Arrangements have been made whereby the new roof terminal coming into use in the West will be similar in both Winnipeg and St. Boniface, with the exception that St. Boniface will carry the soil pipe to the peak of the roof. The latter city has also passed a by-law making it compulsory for plumbers to have a license, the fee being \$25 per year; also permit fees have been raised to 50¢ per fixture.

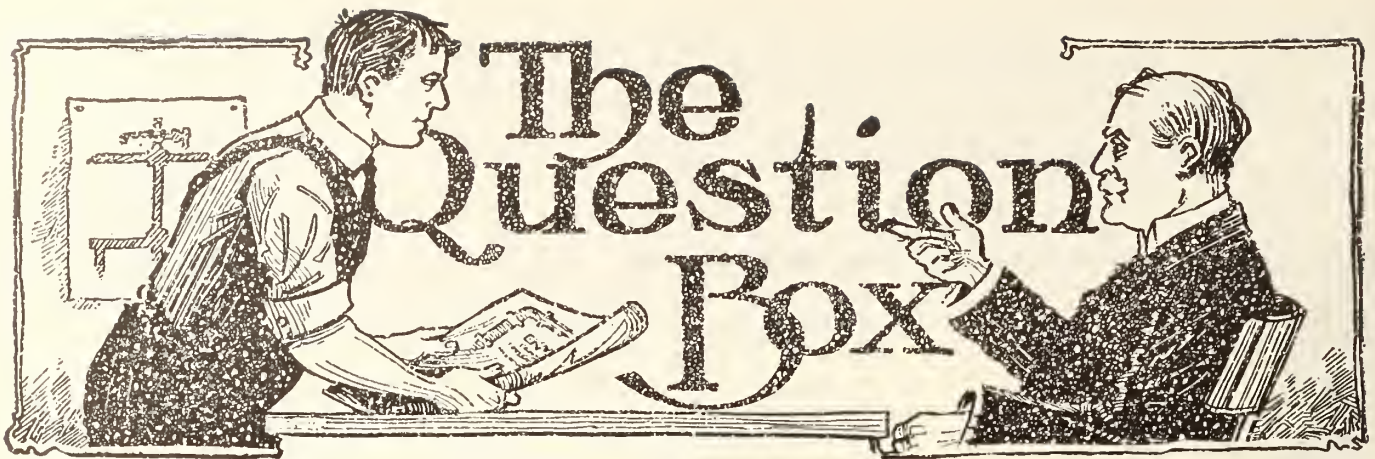
Gas Heater Catalogue.

The Lawson Manufacturing Co., Homestead, Pennsylvania, have recently issued their new catalogue and price list describing their gas water heaters. This catalogue is listed as No. H.14, and not only describes gas water heaters for domestic water supply purposes, but also heaters for small heating systems, which will take care of heating surfaces to the extent of 250 sq. feet. This book should be on the bookshelf of every sanitary and heating engineer, and may be procured free by applying to above address.

Enlarging Plant.

The Honeywell Heating Specialty Co., Ltd., Wabash, Ind., are making a large addition to their plant to cope with the increased demand of their products. This move will mean better and more efficient service than ever to their patrons.

J. Muter, plumbing inspector, Winnipeg, was married recently in Toronto.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

How is This Radiator to Be Connected to Range Boiler?

Editor Sanitary Engineer.—I have been asked if it is possible to heat the bathroom with 18 square feet of wall radiation, from the range boiler, and to make it work. Can you please tell me, and at the same time show me how to take off the connections?

W. C. P., Ottawa.

W. C. P. also sent a sketch which simply showed a range boiler with $\frac{3}{4}$ -inch pipe connections to the water-front and the usual supply pipes to the various fixtures. The size of the bathroom was also given as being 11 ft. x 5 ft. floor space, 9 ft. ceiling. This would give 495 ft. cubic area. Now, the matter as to whether 18 sq. feet of radiation would be enough would all depend upon the location of the bathroom and whether more than one wall is exposed to the outside air; also the size of glass. We believe that in Ottawa the average percentage of radiation is about 8 per cent., and if so, 18 feet would be ample providing the temperature of the water was not less than 150 degrees Fht. Then there is another thing to be considered, and that is the size of water-front and quantity of water used for domestic purposes.

If, however, it has already been proved that the water gets too hot, and that there is lots to spare, then that part of the problem is solved. The method of piping is shown in Fig. 1. It will be seen that the water-front should not be less than one-inch, and providing the rim is not too long, $\frac{3}{4}$ -inch pipe will be large enough in size for the radiator connections. See that not less than one inch in five feet is allowed for the radiator piping which runs horizontally, and note how the hot water supply pipes to fix-

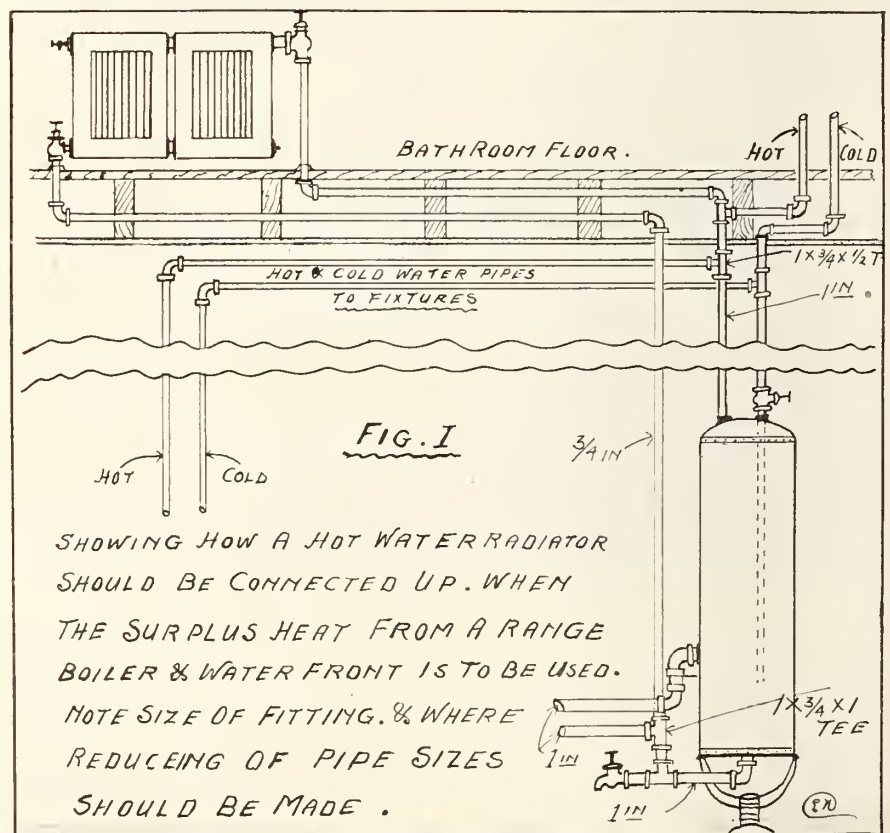
tures are taken off. The radiator should always have the preference in being placed highest, and all pipes should be reamed.

It will be seen that the feed to the radiator is taken off the hot water feed at the top of the range boiler and run to the highest point of the radiator, then as the water contracts in the radiator it falls to the lower pipe and back to the range connection at the bottom of the boiler. A valve is placed at each side of the radiator so as to prevent the heat from circulating up through the radiator in summer time.—Editor.

If meters were installed, how would range boiler be connected to supply system?

Editor Sanitary Engineer.—Your article on waste of water in Canadian and American cities was very interesting, but I fail to see how meters could be installed because of the way range boilers are connected to the main water service. How could the trouble be overcome? I understand that if meters were installed, there would be a back pressure generated when the water in the range boiler ex-

(Continued on page 30.)

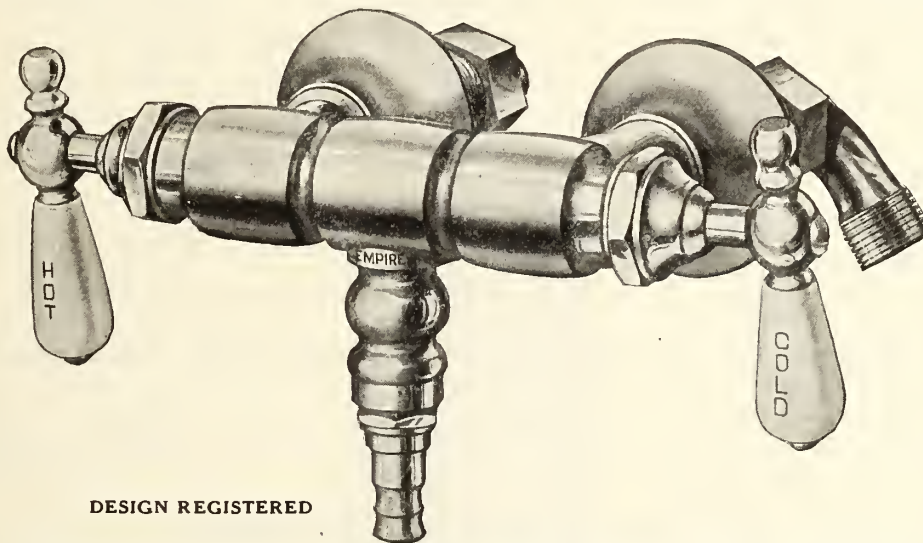


In judging Brass Goods there are three things to consider--- SERVICE, FINISH and DESIGN.

All our brass goods are made from high-grade metal, are thoroughly tested, and the best of **service guaranteed**.

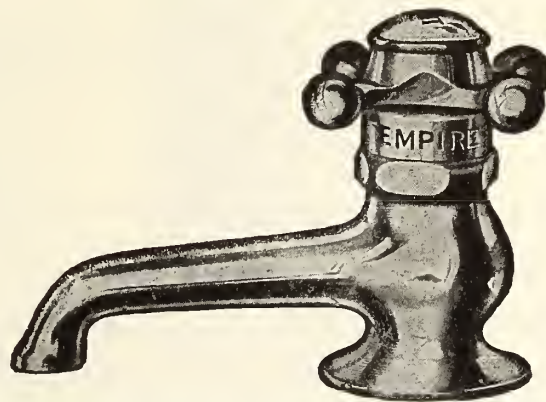
Their **finish** is second to none. Our nickel-plated goods all have the brightest polish and one which will last a lifetime.

For **design** we ask you to examine the two new cocks below. There is beauty in every line and they make a handsome addition to any bath and lavatory.



DESIGN REGISTERED

Quick presson bath cock. Full $\frac{1}{2}$ -inch waterway with $\frac{1}{4}$ turn of handle. Best quality cotton fibre seat.



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IF METERS WERE INSTALLED.

(Continued from page 28.)

panded. Any information along this line will greatly oblige.

J. W. T.

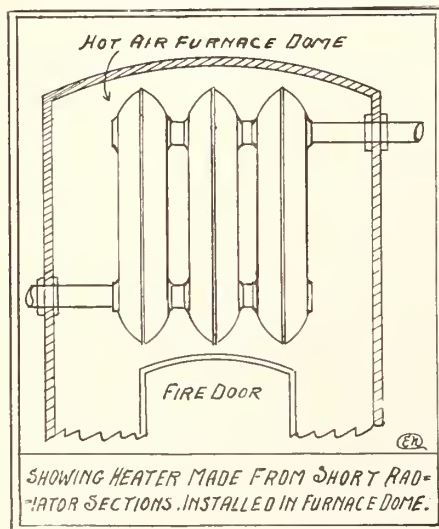
Replying to J. W. T. No doubt the practice of connecting the range boiler direct to the main water supply would have to be discontinued, but why was such a method ever adopted, let us ask? It is a poor practice. It is the cause of such a short life of the range boiler. In times past it was a common thing to hear of a range boiler lasting 10 to 15 years, but to-day it is nothing new to see a boiler renewed in from 3 to 5 years. We cannot say the boilers are so much per cent. more inferior than they used to be. No, the reason is, 15 or 20 years ago there were less of them connected direct to the main water service. They were supplied from an expansion tank, which is the only truly mechanical way to connect them; and by so doing, the life of the range boiler would be lengthened considerably, and there would be less strain on the hot water service than is the case at present. There would be no danger of the water being syphoned out of the range boiler when the stop cock down in the cellar is closed, as is often the case to-day.

* * *

Large Heater for 60 or 80-Gallon Range Boiler.

Editor Sanitary Engineer: A customer of mine has a very large hot air furnace and wishes me to install a heater in it for a laundry. The boiler is to be 60 or 80 gallon capacity. Could you suggest any form of coil or heater which could be placed in the dome, out of the way of the fire. I do not wish to go to the cost of a specially constructed heater, because I know my customer will not stand the price.

A. I. R., Quebec.



Replying to our inquirer A. I. R., we may state that without doubt a properly built heater would be most to be desired. However, we herewith show a very handy heater made up of 3 short sections from a hot water radiator. In placing a heater of this kind in the dome of a furnace care must be taken to have good size of piping between the heater and the boiler, and see that all pipes are reamed, or cut with a good pipe cutter which will not make a burr on the pipes. Further, if the customer can be persuaded to use an expansion tank in connection with the hot water supply, it will be far better, and by far the most economic in the end, because the life of the boiler would be longer and less strain would be put on the whole installation.—Editor.

* * *

Heating Devices.

The Tillman Heating Devices Co., of Indianapolis, U.S.A., are distributing a very handy booklet, which describes



their new heat generator. They make some very novel claims for their generator, out of which is shown herewith. Those of our readers who wish to know more about the Tillman Heat Generator may do so by writing to the above address and procuring one of these interesting booklets.

—*—

Hopper Closets to be Disconnected at Port Stanley.

At a council meeting held recently William Payne was appointed inspector in the waterworks department, to see which houses and cottages are using the

hopper closet, and to notify such users to cease using the same at once or disconnect the waterworks connection within three days of such notice, and if they do not disconnect, to then cut off the water service.

There has been an enormous waste of water by the use of these closets, and to insist upon their being disconnected is the only way the council has of correcting the evil.

The hopper closet is very insanitary anyway, and there has been an agitation for over a year to do away with it and have it replaced by the flush.

—*—

SHINGLES TO BLAME.

Massachusetts is still bending a thoughtful brow over the ruins of Salem.

Everybody agrees that the one thing which contributed most to the spread of the fire was—shingles. House after house burst into flame the instant the rain of sparks touched the tinder-like shingle roofs.

A dry, weathered shingle makes about the finest kindling known. In a closely-populated town a brisk wind carries flames over shingle roofs as fire sweeps over sunburnt prairie grass.

The Bay State is using the Salem fire to start a strong argument against shingles. It will do the rest of the country no harm to listen.

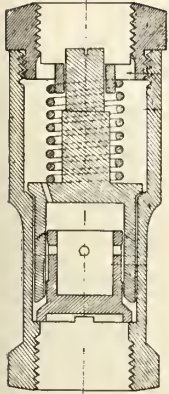
It is significant that two of the few buildings that were absolutely unaffected and which were in the midst of the Salem fire, subjected to falling sparks and burning embers, were covered with asbestos roofing!

This is a period of conservation, and while the Dominion Conservation Commission was first brought into existence it was for the purpose of looking into the conservation of our natural resources, water powers, timber lands, etc., but to-day we find the Dominion Conservation Commission becoming a power for good in that it is looking into all branches of conservation, fire preventative measures are taken up, and health and scores of other matters are being dealt with. Therefore, all that is now needed is the spirit of co-operation along all lines that will reduce the amount of destruction caused by fire.

No person who fully realized the risk he was taking would, in these days think of using wood shingles for a roof, particularly when manufacturers are doing all they can to supply roofings of various kinds which are practically fireproof.

WHAT \$15 DOES

For A Hot Water Heating System



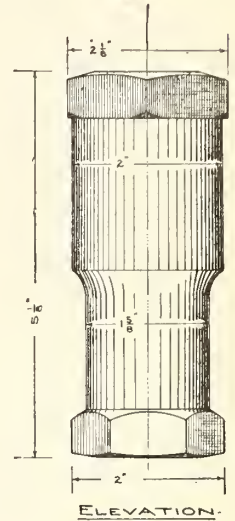
SECTION.

First, it buys a Knickerbocker Automatic Pressure Regulator.

The Regulator enables the hot water system to run AT ANY RADIATOR TEMPERATURE UP TO 250° FAH. Think of it: 250° Fah. is the temperature of STEAM at 15 LBS. gauge pressure.

That means—no more sluggish circulation—no more complaints of failure to heat in very cold weather. It means a smaller job for the same building: one square foot of radiating surface, at 250° Fah., gives off as much heat as one and one half (1½) square feet of radiation at ordinary hot water temperatures. It looks like a pretty good thing—on paper—doesn't it? Well, it's just as good as it looks, for the Regulator is sold with a Morrison guarantee.

Descriptive circular and discount to the trade on application.



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Babbitt Metal, Bar Solder, Wiping Solder, Wire Solder, Lead Pipe, Bar Lead, Traps, Bends, Copper, Tin and Antimony.

Let the goods prove their worthiness of a place in your stock. Send a trial order.

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Toronto, Ont.

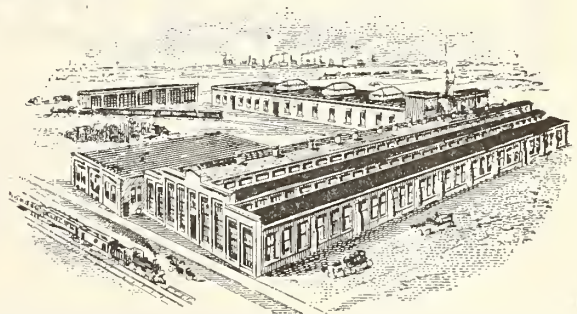
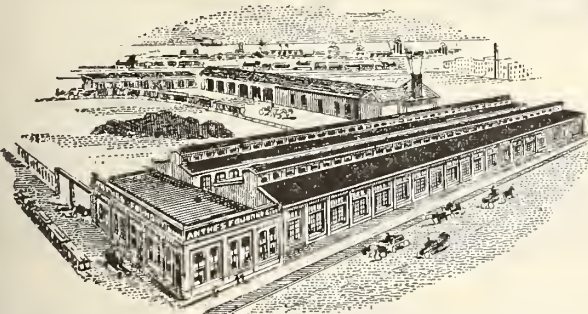
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Sani-flush is poured into the water and forms a solution which loosens the deposit in the trap by chemical action. It cleans the entire water-closet bowl — the seen and unseen parts. Keeps the bowl white as new, sanitary, and odorless. No

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Perfectly safe to handle and use; cannot injure the bowl or connections. Its frequent use insures a clean and sanitary condition. Scouring, brushing, and the use of dangerous acids fail to reach the unseen trap or outlet, with the result that the latter becomes dirty and makes the water standing in the bowl foul and offensive. Get your customers to try Sani-flush, and they will always use it.

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The Trap
which you
can't clean
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DOMESTIC ELECTRICAL WORK BY WILLIAM A. WITTEBECKER. Concise and Practical Explanation for Sanitary Engineers on How to Wire Buildings for Bells, Alarms, Annunciators, and for Gas Lighting from Batteries. The information given is practical, and with a close observance of the directions laid down, any one, though entirely ignorant of electricity, should be able to do the work described. Illustrated with 22 diagrams. Price, in paper, 25c postpaid. Price, in cloth, 50c. MacLean Pub. Co., 143 University Avenue, Toronto.

VACUUM CLEANING SYSTEMS, BY M. S. COOLEY. A fine and authoritative treatise on the art of vacuum cleaning. Contains all the author's tests of vacuum-cleaning apparatus, history of mechanical cleaning, requirements of an ideal vacuum cleaning system, also chapters on carpet renovation, vacuum producers, separators, hose, fittings, etc. 244 pages, 6 x 9 inches; 105 illustrations, 20 tables. Price postpaid, \$3.15. MacLean Publishing Co., 143-149 University Ave., Toronto.

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WANTED—BY LARGE MANUFACTURER, young draftsman with some knowledge of steam and hot water heating. Excellent future for right man. Apply Box 88, Sanitary Engineer. (15)

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WANTED — HIGH-CLASS SALESMAN TO call on Toronto architects for boiler manufacturer. One with connection preferred. Apply, stating experience, to Box 89, Sanitary Engineer. (15)



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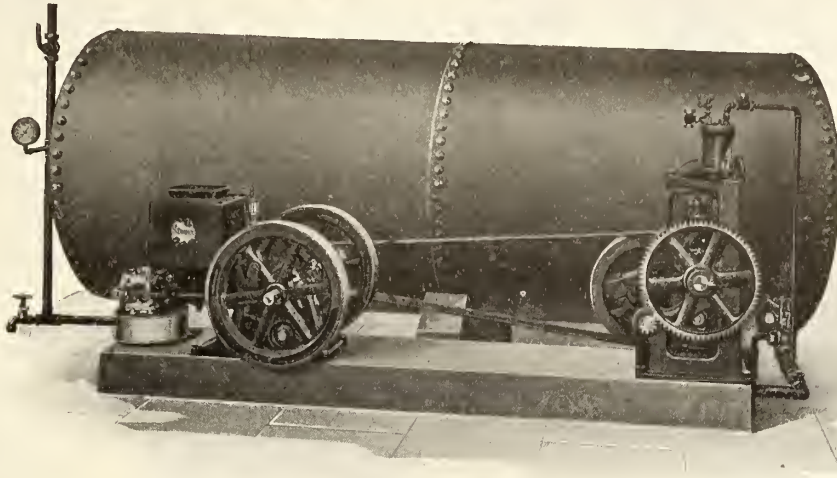
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Large
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We
Surpass
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For large capacity, from Deep Drilled or Dug Wells the Luitwieler Non-Pulsating, Double-Acting Deep Well Pump has no equal.

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"CLIMAX" You Can't Make 'em Better

"CLIMAX" plumbing specialties are the result of years of experience, and can be relied upon to work when wanted, to do the work they are severally made for doing, and to do it always to the complete satisfaction of the user.

DURABLE, ECONOMICAL,
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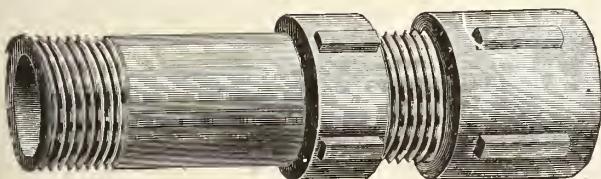
"CLIMAX" Specialties are Stocked by the
Leading Canadian Jobbers



Cellar Drainer



"Y" Branch
Double Plug

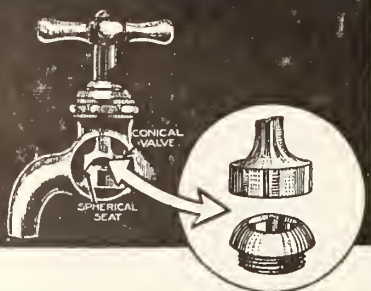


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The J-M Washerless Faucet eliminates the rewashering nuisance—stops valve leakage and water waste—prevents the staining of porcelain due to constant dripping—and does away with “whistling” and “water hammer.”

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Valves; Washerless Faucets;



Copper Floats; Pipe Coverings;
Pipe Joint Cement; Joint Run-
ners; Packings; Etc.

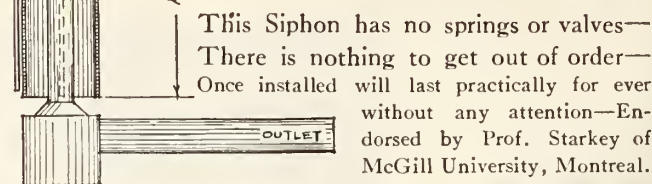
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WINNIPEG

VANCOUVER

MEARNS' SIPHON FOR SEPTIC TANK



This Siphon has no springs or valves—
There is nothing to get out of order—
Once installed will last practically for ever
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dorsed by Prof. Starkey of
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By **Ervin Kenison, S.B.**

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sachusetts Institute of Technology

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Mechanical Drawing, based on methods that
have stood the test of years of experience.
Includes orthographic, isometric and oblique
projections, shade lines, intersections and
developments, lettering, etc., with abundant
exercises and plates.

Price, \$1.00

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Technical Book Dept.

143-149 University Ave., Toronto

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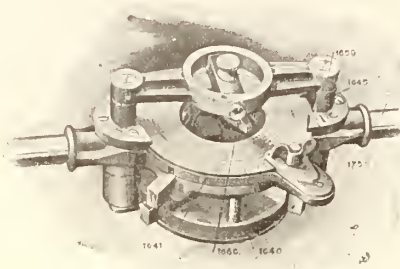
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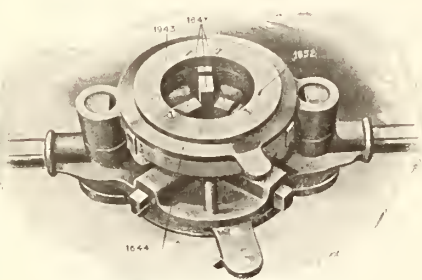
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National Equipment Co., Ltd., Wabash Avenue, Toronto.

Premier Die Stocks



Die Stock Open



Rear View of Die Stock

Threads pipe 1 to 2 inch right and 1 to 2 inch left with one set of dies.

No trouble with leader screws and nuts. The new patented **Off-Set Die**, which can be used only in the Premier has overcome the difficulties.

The Die is made in such a way that once over the pipe it accomplishes what any other make of die would in going over twice, as one set of teeth is much lower than the other, consequently every tooth does an equal amount of work.

The "PREMIER" will cut straight and running lock nut threads, and will thread a 5½-inch nipple at both ends without the use of a nipple holder.

No separate bushing or dies to carry around and lose.

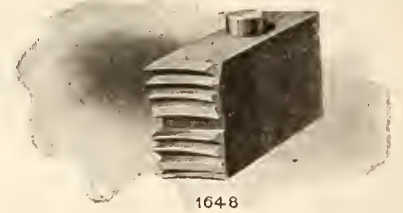
The "PREMIER" has but one lock, and that is used when changing from one size to another. The centering device has a scroll cam, without locks, which operates the three jaws that guide the die stock on pipe.

The "PREMIER" works so easily that a novice can operate it. It not only starts itself on the pipe—it automatically throws itself out after a "Briggs" Standard Thread is cut instead of backing off, which spoils the dies.

Write for full particulars.

The Borden-Canadian Co.

66 Richmond St. East, Toronto, Ont.



Two Dies in One

Say, Mr. Plumber, Look at This Self-Closing Cock

Note its graceful outlines, its solidity and its evidence of good workmanship. It has every exterior point of appeal to the customer.

MUELLER Colonial Self-Closing Work

Is artistic in design, and mechanically it is perfect, operating on roller-bearings and adjustable to any pressure. It has wonderful wearing qualities and will be a satisfaction to you and your customers.

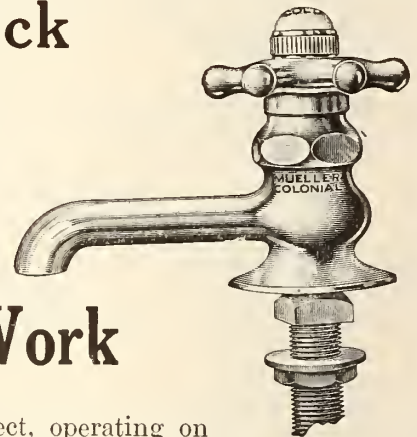
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SARNIA, ONTARIO

MAKERS OF HIGH-GRADE PLUMBING GOODS.

MUELLER Colonial Self-Closing Basin Cock



D-12902

S.E.

H. MUELLER
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Sarnia, Ont.

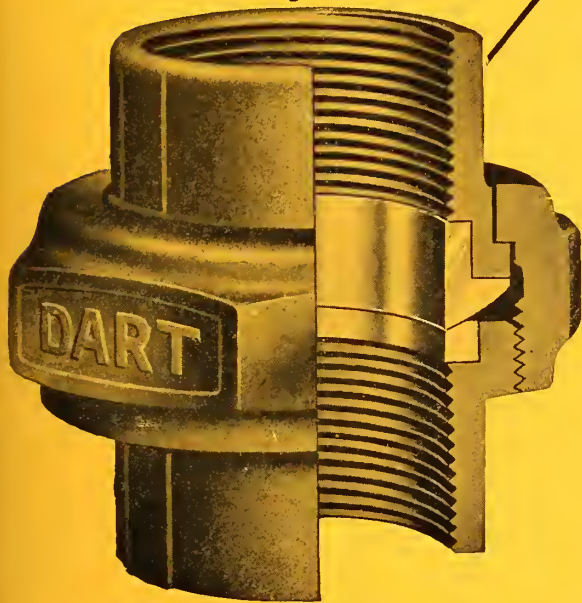
Send me literature
and prices on Mueller
Colonial Self-Closing
Work.

Signed

City Province

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Bronze to Bronze At The Joint



Using "DART" UNIONS

on pipe work is insurance of
satisfied customers

as both faces of the Dart are of
bronze there is no deterioration at
the joint.

When a Dart is put on a job it is
there to stay PERFECTLY TIGHT
until deliberately loosened with a
wrench.

The Ball-Shaped Joint permits con-
nections to be easily and quickly
made whether pipes are in or out of
alignment.

Our trade-mark (for your protection)
is cast on every Union.

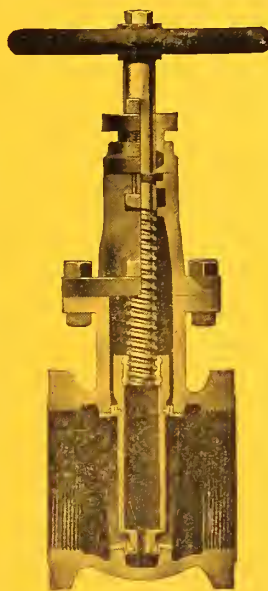
Your jobber has them in all conven-
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Dart Union Company, Ltd., Toronto, Ont.

K E R R ("New KEYSTONE" Pattern) GATE VALVES



If you have not
used any of these
New Pattern
Valves, specify
"KERR" in your
next order. We
want you to get
acquainted with
the most reliable
valve on the
market.



If you have been
using them, we
are confident that
our satisfaction
will bring us your
repeat orders.
These valves will
never cause you
or your customer
the slightest
trouble. Their
high quality is
consistent.



When you buy a "KERR" Valve you get a guaranteed article that is backed by a reliable firm.
Many of the largest distributors of valves in Canada have sold "KERR" Valves for over 25
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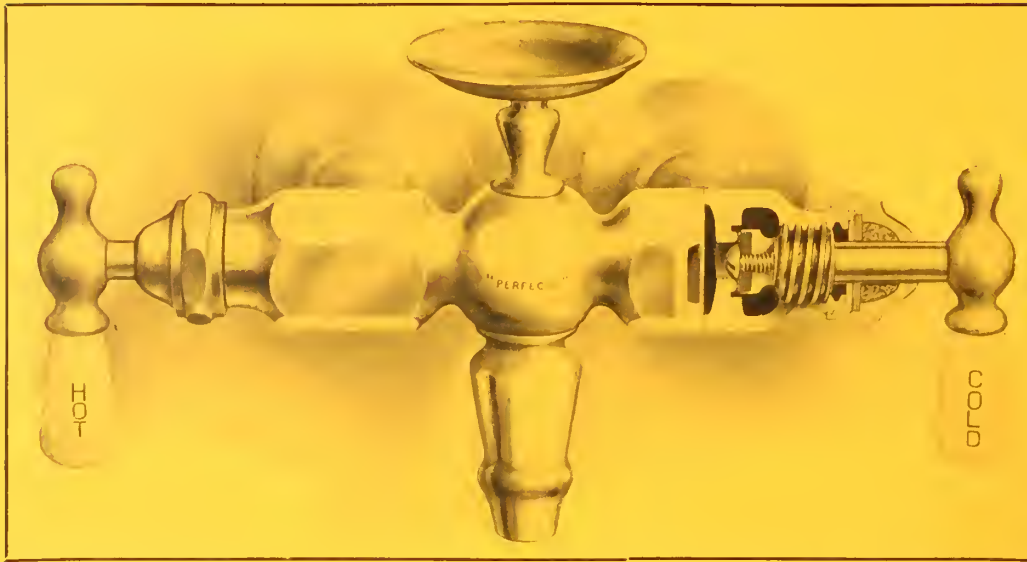
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Valve Specialists

Walkerville, Ont.

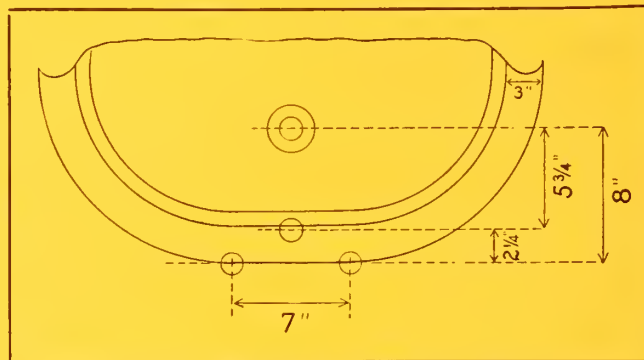
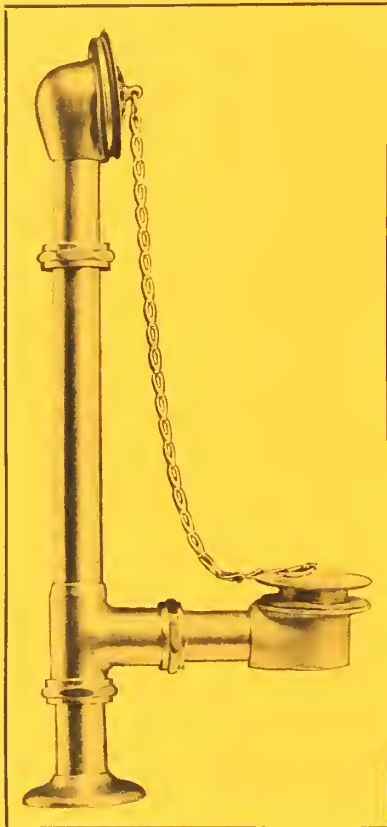
THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

GALT BRASS



"PERFECTO" (REG. 1913)

Use The "Perfecto" when in a hurry—
Saves half the time and all the worry.



"ROUGHING IN"



THE
"PERFECTO"

BATH COCK is a modern achievement in the quick-pressure or rapid-opening type, giving you lever action, and largest waterway made, coupled with a very attractive design.

COMBINATION WASTE AND OVERFLOW—Heavy cast parts, being adjustable, you have no tubes to cut, making it a great time saver.

SUPPLY PIPES are 3/8-inch iron pipe size and weight, seamless, annealed, offset, one piece of metal with expanded collar supporting conical rubber washer, and threaded at floor.

"ROUGHING IN" will, we trust, be of convenience to you. (All our other styles rough in the same as the "Perfecto.")

GUARANTEE—Same as we extend on all goods bearing our name.

SEND US YOUR ORDER NOW.

GALT, CANADA

BATH SET

THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

Publication Office : TORONTO, AUG 15, 1914

No. 16

"HERCULES ENAMEL" LAUNDRY TRAYS With "Cast-In" Washboard



A CHEAP, DURABLE, SANITARY ENAMELED CAST IRON LAUNDRY TRAY To take the place of the brittle, water-logged, unsanitary Cement Tray

After considerable experimenting we have succeeded in producing a Wash Tray which we are able to offer to the trade at a price sufficiently low to interest the many prospective purchasers who cannot afford, or who are unwilling to pay the higher price for our White Porcelain Enameled Trays.

"HERCULES ENAMEL" is totally different from the regular white porcelain enamel, and its composition makes it possible to successfully cover the corrugations of the **CAST-IN WASHBOARD**, which is not feasible with white porcelain enamels. It is the **IDEAL ENAMEL** for Laundry equipment and is capable of withstanding the rapid expansion and contraction usually caused by the alternate use of Boiling Hot and Cold Water.

The **CAST-IN WASHBOARD** is a feature of these new trays. It saves the expense of the old-fashioned **SEPARATE** Washboard, which, aside from its inconvenience, is extremely unsatisfactory, in that it must frequently be repaired or replaced. In the new "HERCULES" Trays the washboard is there forever.

It's New—It's Practical and Durable and—It's Cheap. Write for circular and prices.

MADE ONLY BY

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

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119 King St. East

MONTREAL
42-44 Beaver Hall Hill

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76-82 Lombard St.

VANCOUVER
410 Carter Cotton Bldg.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

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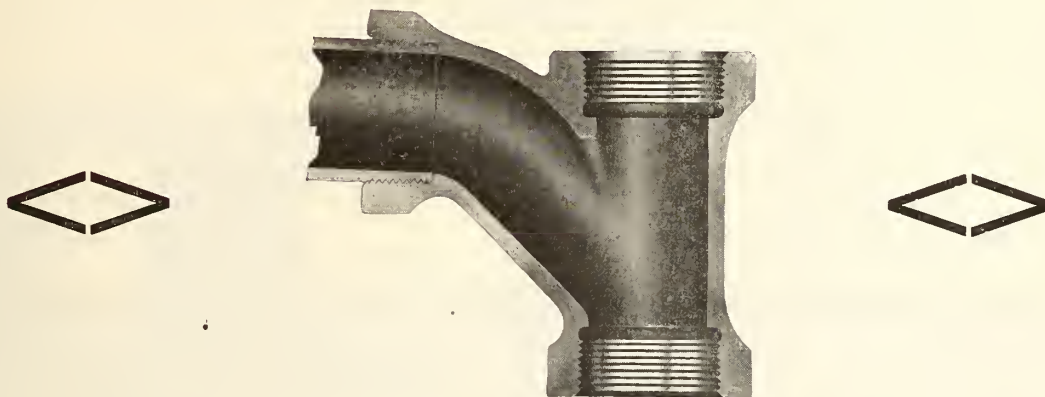
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RECESSED DRAINAGE FITTINGS

**We are now Manufacturing
a complete line**



FITTINGS LIMITED OSHAWA

MONTREAL

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OSBORNE HOUSE, ISLE OF WIGHT
FORMER RESIDENCE OF THE LATE QUEEN VICTORIA OF ENGLAND



ROYAL PALACE OF LA MAGDALENA
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COUNTRY RESIDENCE OF THE KING AND QUEEN OF ENGLAND

Royal Palaces in which "Standard Sanitary" Plumbing Fixtures were installed—a few notable examples of their world-wide popularity

"Standard Sanitary" Plumbing Fixtures can be obtained anywhere in the Dominion. They are handled by leading Plumbers throughout the provinces and are carried in stock by Jobbers and Sales Agents throughout the Dominion of Canada, thus facilitating prompt deliveries.

Standard Sanitary Mfg. Co.

Limited

General Offices and Factory: Royce and Lansdowne Aves., Toronto, Ontario

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20-28 Jackson Street, West



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PALACE OF THE KING OF THE BELGIANS
BRUSSELS

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THE DAISY BOILER

Over 55,000 DAISY Boilers

are giving the best of service throughout Canada.

The Daisy has qualities which make it a better proposition than any other on the market.



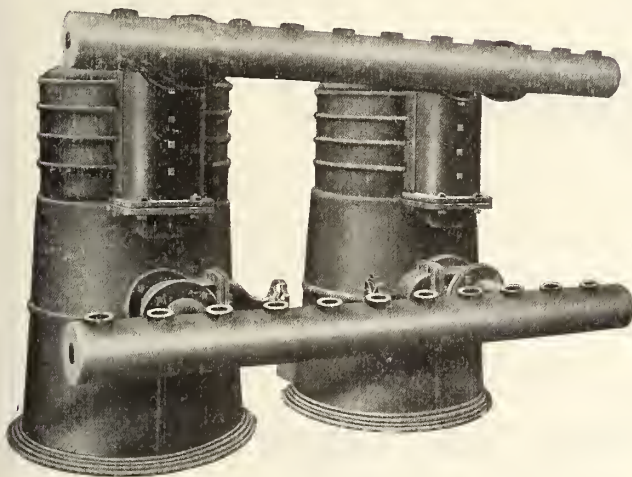
Made in the best equipped plant in Canada.

Without doubt the most popular boiler made.

Every installation means another customer satisfied.

Minimum consumption of fuel.

Maximum amount of heat.



Rear view of two Daisy Boilers connected with twin headers. This system gives great satisfaction in mild and extreme weather.

WARDEN KING LIMITED, MONTREAL

BRANCH, 200 Adelaide St. West, TORONTO

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The CRANE & ORDWAY CO., WINNIPEG, MAN.
The MECHANICS' SUPPLY CO., Limited, QUEBEC, P.Q.
The JAMES ROBERTSON CO., Limited, ST. JOHN, N.B.
The WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

Progress:---

These are days when something better, more satisfactory and of less cost and attention to operate, is demanded in all mechanical equipment of buildings.

The Heating question is no exception; in fact, it is one of the most important factors.

The general opinion is that the Vacuum or Vapor Systems of Heating are best suited to accomplish satisfactory results—and after all, is it not results that count?

The determining point of value in such a System is the device used on the return end of each radiator. There are things which it must do positively and also things it must not do in order to make good.

The Dunham Radiator Trap used on the return end of each radiator in a Vacuum or Vapor System of Heating—Is built to meet the existing conditions—It does so—It gets results—It has and will make good.

If you are not fully posted on this question of heating, let us get together. We like it because it is our business: You will delight in it because it will mean more business.



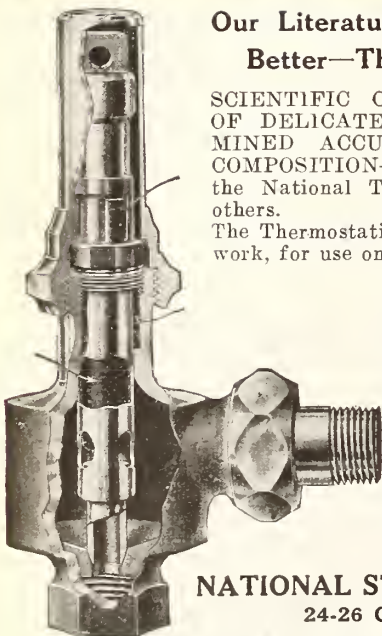
Passes water and air freely. Closes off tight against steam. Does not clog up.

C. A. DUNHAM CO., Ltd., Toronto, Can.

Vancouver—520 Duncan Bldg. Calgary—Metals Ltd. Winnipeg—405 Tribune Bldg. Montreal—No. 20-11 St. Sacramento St.
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National Valves.

Scientifically } Correct
Economically }
Usefully }



Our Literature Tells Why They're Better—Their Use Proves It.

SCIENTIFIC CONSTRUCTION—ABSENCE OF DELICATE PARTS — PRE-DETERMINED ACCURACY — BRASS-ENCASED COMPOSITION—all of these are features of the National Thermostatic Trap—there are others.

The Thermostatic Valve is adapted to various work, for use on Vacuum Systems, Dry Kilns, etc., etc., and is guaranteed for 5 years.

If you want Perfect Service, based on perfect valve principles, the National Thermostatic Valve will answer this purpose.

Write for our literature on the complete National Line, such as the B Heat Intensifier, B Pipe Joint Compound, "Perfection" Radiator Fitting, etc., etc.

NATIONAL STEAM SPECIALTY CO.
24-26 Clinton St., Chicago

Surplus, Dunn & Co., 74 Murray St., New York
L. N. Vanstone, 8 Wellington St. East, Toronto
Moncrieff & Endress, Limited, Scott Bldg., Winnipeg

300,000 lbs.

carried in stock for immediate
shipment of

Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

Brass and Copper Rod.

Brass and Copper Sheet.

WRITE US FOR PRICES

Tallman Brass & Metal Co.
HAMILTON, ONT.

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."



General Sam Oven with the Gurney Foundry, who sends a despatch to the outposts in charge of the Plumbers and Steamfitters.

Business is Warfare!

A boss I had in the old days used to say, "Yes-sir, business is warfare."

And what he meant was this—business is a struggle for more trade and a fight to keep what you have. It means the careful planning of attacks on competition: a capable organization to take advantage of every opportunity for sales: the establishment of a reputation for honesty and service.

Business is constructive warfare. It means building up, not shooting things to pieces. And Business offers a man as great opportunities for initiative, persistence and courage as battle does.

You must keep alert or the enemy will steal your trade. You must keep well posted or you will lose the skirmish for the sale of a stove or heating plant. To relax your efforts or your vigilance means that your business will be captured or disabled.

Our battle for business commenced in 1843 when this plant was founded.

We now have outposts in Canada from coast to coast, the Plumbers and Steamfitters who sell Gurney Goods, and I may say that all together we are successfully conducting the greatest fight for the Plumbing and Heating Supply Business that was ever waged in this country.

We have a great stock of ammunition, from the smallest fitting to the largest steam boiler.

As one of the Generals at Headquarters, I take this opportunity of thanking those in charge of outposts for the way they have conducted campaigns in their special territory.

(General) Sam Oven



The Gurney Foundry Co., Ltd.

Established 1843

TORONTO,

CANADA



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SOMETHING NEW THE GEYSER AUTOMATIC WATER HEATER



is composed of a vertical cylinder from four to six feet long, according to size. The cylinder contains brass pipes which receive the steam and transmit heat to the water. These pipes are screwed to the base chamber, but remain independent from one another at the top, consequently, the expansion is entirely free, and leaks are impossible.

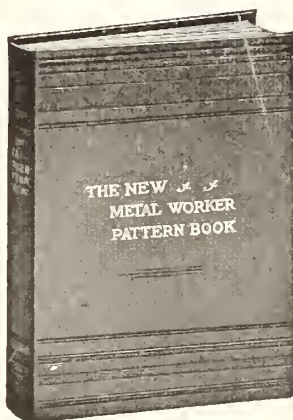
FULLY GUARANTEED
MANUFACTURED BY

THE E. S. MANN CO.,
MONTREAL

We
Manufacture
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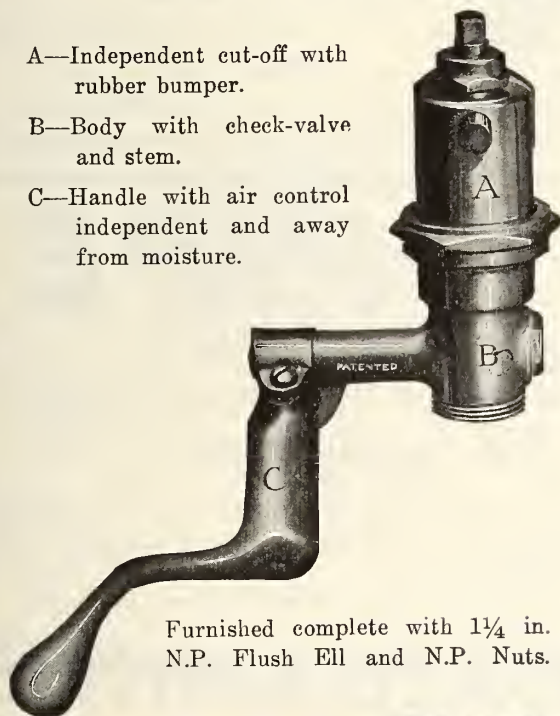
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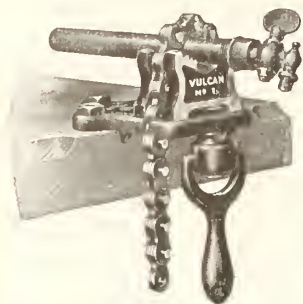
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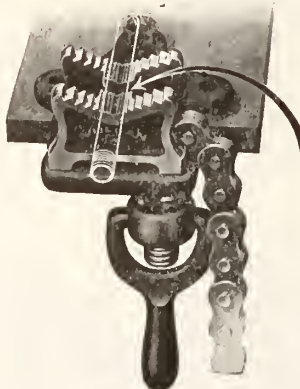
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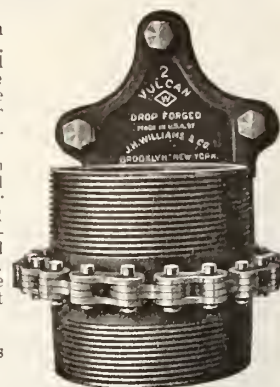
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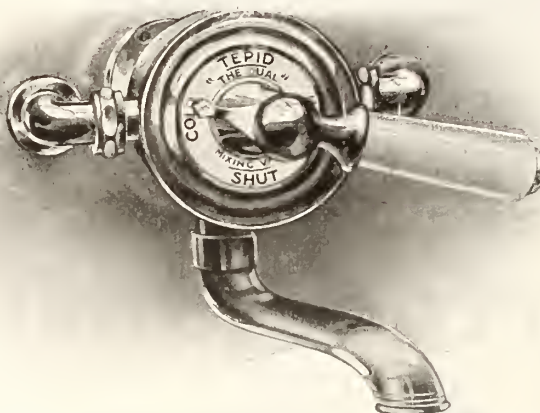
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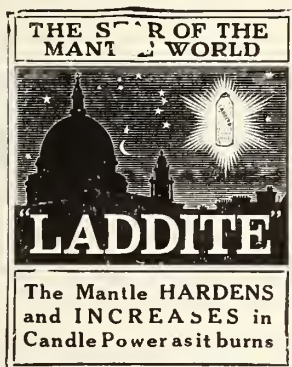
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PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, AUGUST 15, 1914

No. 16

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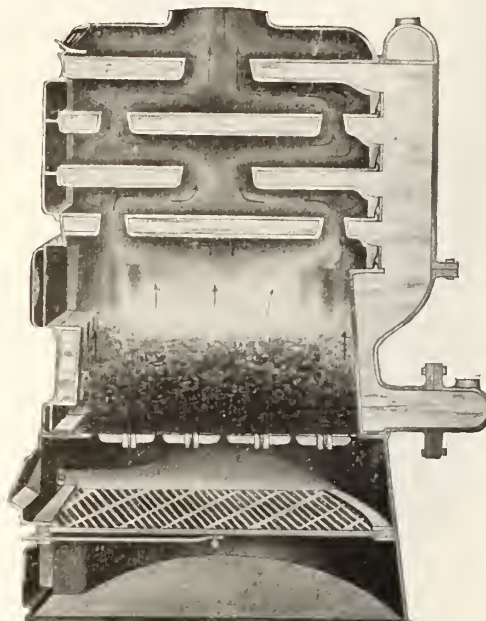
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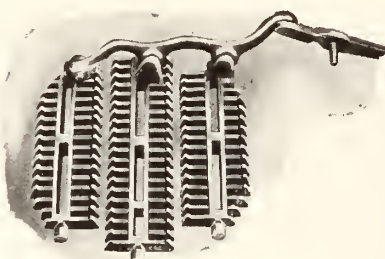
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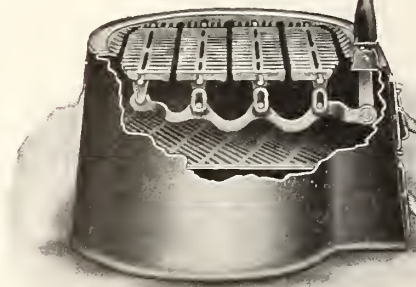


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THE SANITARY ENGINEER

VOL. VIII.

AUGUST 15, 1914.

No. 16

The Handling of Cast Iron Enamelware

Showing That Cast Iron Enamelware is Unnecessarily Abused by Workmen—That They Should Take More Pride in a Neat Job, and in That Way Build up a Good Reputation for the Craft as a Whole.

OF all fixtures used by sanitary engineers which get the most amount of rough and careless handling it is that of cast iron enamelware. It seems to be the impression that because such fixtures are made of cast iron they will stand any kind of treatment, but such is not the case. No doubt the result of the rough handling is not always apparent at the time when the actual damage is done, therefore the same treatment goes on. The first step which



Examined all goods before accepting them.

should be taken is at the receiving end. A workman or receiving clerk should examine the goods by looking through the crate, and if the crate itself has the appearance of having been carelessly handled, the attention of those delivering the goods should be called to the fact, and a record taken. Then, again, when the goods have been received they should be given fair treatment, and not

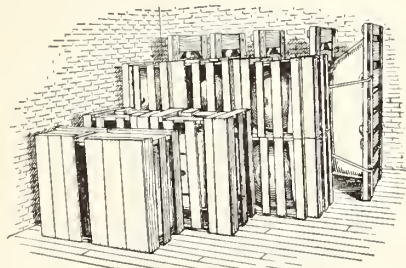


Never allow fixtures to fall.



Do not walk a bath. Get help and carry it carefully.

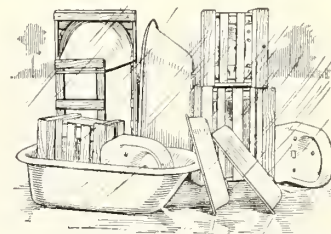
thrown down any old way, simply because they are goods of a heavy nature. There should be lots of help on hand when cast iron enamelware is being transferred from one place to another. The storing of such goods should also receive some consideration. The very fact of their being heavy and having a white porcelain coating should warrant them being placed in order, so that too frequent handling will be eliminated. Such goods should be placed in a good



Store goods in dry place in such order as to prevent unnecessary handling.

dry place, and not exposed to the weather. If greater care were taken with this line, the result would be shown when the goods are installed. Nothing looks so bad as a white porcelain enameled fixture, with a host of scratches and here and there a chip off the rim or other part of the fixture. Fixtures should never be sent to a building before the "roughing in" and test has been passed. It is nothing short of scandalous to see beautiful fixtures exposed to all kinds of weather, dumped on a pile

of rubbish or stuck in the corner of a building, during the time the plasterers and carpenters are at work. Many a time when going the round of buildings under construction it is a common sight to see a plasterer using a fixture as a trestle. Such would not be the case if all such men had their work done before these fixtures are brought to the building. There is no reason in the world why a lavatory should be installed before the plastering is done, except it be



Keep goods under cover and not exposed to all kinds of weather.

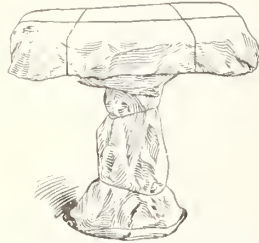
a pedestal type, and then it should be well wrapped up. Neither is there any reason why a bath should be uncrated before it has been moved the last time. A delivery wagon which is used to cart goods of various kinds is often responsible for a lot of damage done to enamelware, and particularly if the goods are uncrated. The fact is when these goods are uncrated the delivery man is apt to put all kinds of goods into them. The other day the writer actually saw an uncrated bath full of warm air furnace fittings, zinc elbows, etc., on a wagon.



Plasterer using lavatory for trestle. Such abuse spoils the fixture.

Such could not have been the case had the bath been in a crate.

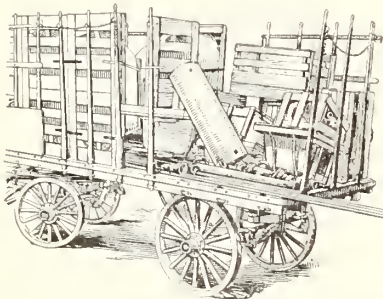
It is a very common occurrence to see all kinds of truck piled into a bath when a building is about finished. For instance, if there is a hardwood floor to be laid and the bath is placed on one side before actually having been fitted up, the carpenter finds it a handy place to lean his saw against or hang his brace on. The painter finds it a handy place



If pedestal lavatory has to be fitted up before house is finished, wrap it up.

to put his oil can in, for fear of the can being upset. The carpenter, too, finds the bath makes a fine saw horse for him, all of which is bound to disfigure the fixture.

Then we have men in our own craft who take no pride in their work. When fitting up a fixture nothing is so common as to see dirty finger prints on the



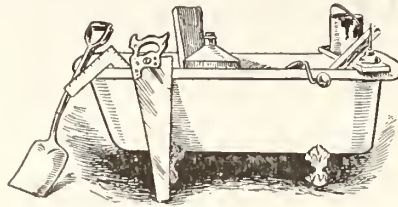
Never put fittings in a porcelain fixture.

sides of the bath or fixture which is being installed, and the helper, to make matters worse, will borrow a pail from the plasterer, get some water (full of grit) and a piece of dirty waste to wash off the greasy finger marks. And what is the result? The fixture is ruined in appearance. The writer has "fired"



Should be left in crate till installed.

many a boy for such work; but we cannot expect too much of the boys. How many times have we seen scratches in



Handy place for carpenters' tools, oil cans, etc.

the bottom of a bath, caused by the journeyman standing in it when fitting up the shower fixture? We must not forget that "example is better than precept," and that if we instruct our men to be more careful when handling this class of goods, if plenty of help is given to lift them about from place to place,



Sloppy workmanship.

we will very soon find that they will themselves be more careful. A very common practice when putting the feet on a bath is to hammer them into position. The writer was in a hardware store some months ago and saw a bath

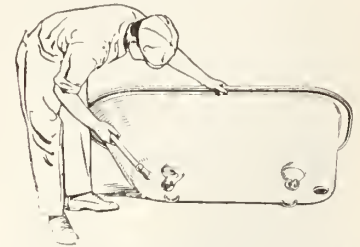


Never stand in a bath to fit up the shower.

with a patch of white paint on the bottom. When he asked the cause, he was told that one of the men got mad because the legs of the bath were too tight. Then to make matters worse the householder "must have let hot water into it," which, of course, raised the enamel off. This fixture was being put up for

sale for half price, thus spoiling the sale of a perfect article.

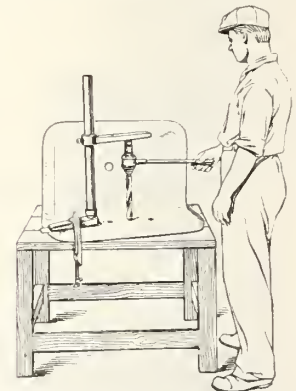
When installing a roll-rimmed sink in a country residence, where hard and soft water is to be used, it is often found necessary to have a third hole in the back. If such is the case, the sink can be got from the manufacturer at a very small extra cost; in fact, we feel the cost would be so small that it would not pay



Do not use a hammer when fitting legs on the bath.

a sanitary engineer to drill it. Beside that, if the job is done at the factory there is no "chipped back" and no lost time.

The same argument applies when it is found necessary to cut out a piece of the edge from a flat rim sink to make room for the supplies. No cast iron enamelware should be either cut or drilled after



Never drill holes in back. Factory is the only proper place.

it is enameled. Such a course is bound to damage the goods, more or less. If the men who install this class of goods would take more pride in their work the whole craft would benefit. The manufacturer would appreciate the fact as much as the public, and a better service all round would be the result.



Cutting sink rim spoils the fixture. Should be done at factory.

Poor Work Installed in Public School

A City Architect Passed a Certain Installation, Even Though it Was Not Installed in Accordance With the City By-laws—All Such Work Should be Under the Jurisdiction of the Health Department.

A Reader's Criticism of Article Which Appeared in July 1st Issue.

In your criticism of this job you lay stress on the fact that the work was done contrary to a certain clause in plumbing rules which calls for each w.c. to be separately vented, and which you say is an up-to-date by-law. I do not agree with you in this regard, as in most of the plumbing by-laws compiled in the last few years and others at present in preparation, the individual venting of fixtures in battery installation has been abolished in favor of the common-sense and practical loop system of venting.

This system does away with a lot of unnecessary and costly work, and has been found to meet all requirements as to the retention of trap seals, ventilation of branches, etc. The present job could easily be converted into an up-to-date installation by taking off a branch between the $\frac{1}{8}$ in. bend and double Y, extending same to near ceiling and across under ceiling, connecting into main vent pipe extending through roof, leaving the two fixtures connecting into the base of the stack as at present connected. This is according to the best practice as this connection insures the vent-pipe being kept clear of all obstruction.

The venting of the fixture trap, however, could be improved upon. The illustration shows the trap vented from the crown. This is bad practice, but we must admit, a practice by a good many members of the craft who certainly know better; but you know it is a nice and handy plan to make a showy wiped joint on a lead trap, and therefore utility is sacrificed for the sake of appearance.

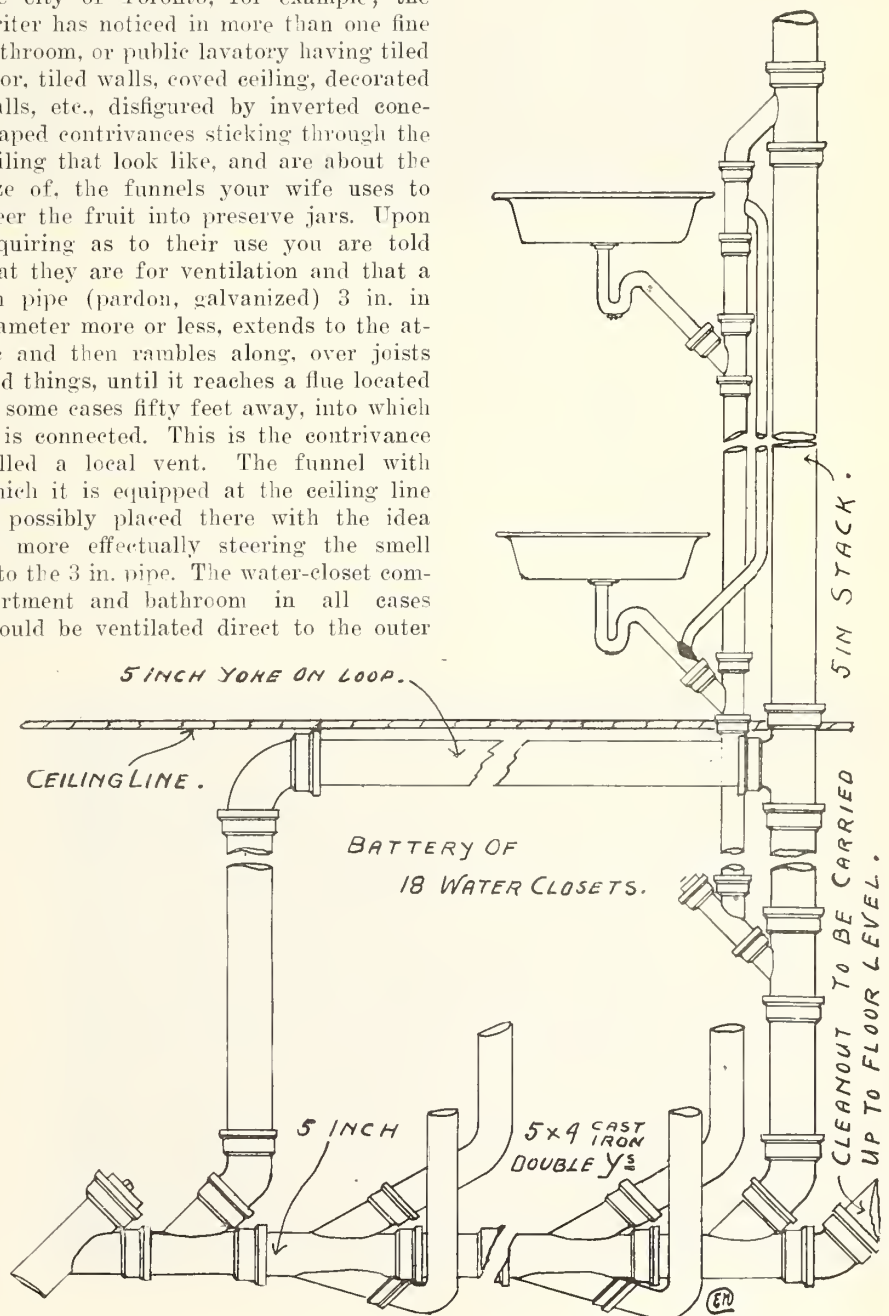
The waste stack from these fixtures should have been connected into main vent above the highest fixture. The vent from trap of lower fixture should be connected as close as possible to the Y branch, and extended up and connected to waste stack above the level of upper fixture. The offset between point of connection of the vent pipe, to trap and vertical vent should be made at an angle of not more than 45 deg.

However, I will wager that this portion of the work constructed as illustrated, will pass the so-called "up-to-date" plumbing by-law, especially in the case of a good many of the smaller towns and cities where the inspector is a clerk or student in the engineer's department. But with a good hard-headed and stiff-backed inspector on the job,

one who has backbone enough to vary from the letter of the by-law when he knows it is in the interests of better work, such work as your article refers to would not pass, architect or no architect.

The clause in the by-law which refers to local venting of closets will also bear some criticism. This local venting as carried out in most cases is practically worthless; in fact, it is a joke. Take in the city of Toronto, for example; the writer has noticed in more than one fine bathroom, or public lavatory having tiled floor, tiled walls, coved ceiling, decorated walls, etc., disfigured by inverted cone-shaped contrivances sticking through the ceiling that look like, and are about the size of, the funnels your wife uses to steer the fruit into preserve jars. Upon inquiring as to their use you are told that they are for ventilation and that a tin pipe (pardon, galvanized) 3 in. in diameter more or less, extends to the attic and then rambles along, over joists and things, until it reaches a flue located in some cases fifty feet away, into which it is connected. This is the contrivance called a local vent. The funnel with which it is equipped at the ceiling line is possibly placed there with the idea of more effectually steering the smell into the 3 in. pipe. The water-closet compartment and bathroom in all cases should be ventilated direct to the outer

air, and if possible lighted in the same manner. See that this is carried out and there will be no need of such a makeshift contrivance as the local vent to quieten the conscience and deceive the public. If our local boards of health were on to their jobs such cases as that cited in the city of Toronto would not be allowed. They need prodding and waking up; they are great on theory but in



a good many cases sadly lacking in actual practice.

Now, the best interests of things sanitary will be served by our craft and the board of health departments working in harmony, and to that end, as has been often suggested and in some places made the rule, a member of our craft should be on the board of health. Therefore let this be one of the points insisted upon in the proposed Provincial Code.

W. A. TIPPER,
Brantford.

Replying to W. A. T., we would ask him and others of our readers to again look over the article mentioned and they will see that the question was taken up in such a way as to prove mainly that it is necessary to have only practical men filling the position of plumbing inspectors. And second, that by-laws should be observed. Now we will take up the matter from a technical standpoint. No doubt the backventing practice is overdone. We have emphasized that fact many a time in the Sanitary Engineer, and in Fig. A we will show how it should have been done, but we wish our readers to note that the drawing shown in our last issue had no vents whatever, and if there are any by-laws allowing batteries of W.C.'s to be installed as we showed, we will condemn the practice. We believe in venting under certain conditions and state that there

backventing of w.c.'s when in battery, except a few out west and these are only very recent; in fact, so recent that the by-laws are not yet in printed form. One of the greatest troubles with our various plumbing by-laws is the fact that certain rules are laid down irrespective of

years ago has been proved otherwise to-day, and such will be the case until the angel Gabriel blows the last trump.

The trouble has been, and is to-day, that we are clinging to methods belonging to the long ago. W. A. T. says that the boards of health need wakening up.

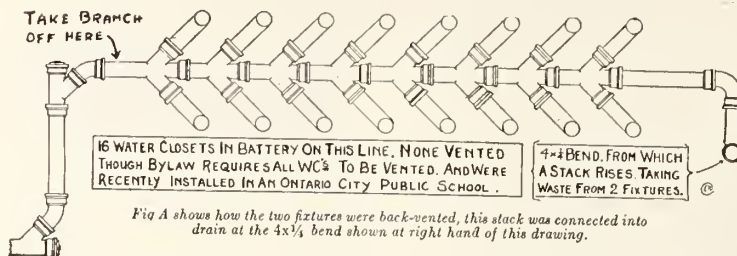
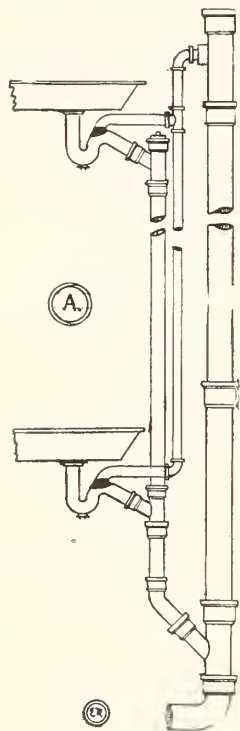


Fig A shows how the two fixtures were back-vented, this stack was connected into drain at the 4x4 bend shown at right hand of this drawing.

conditions, circumstances or good practice.

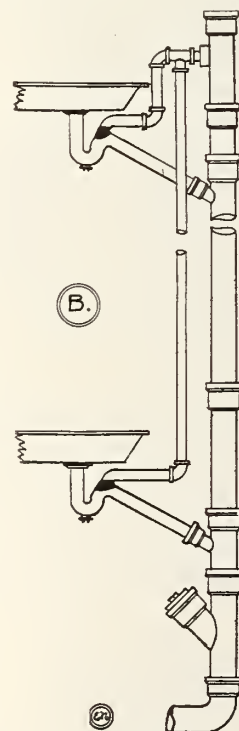
Now regarding W. A. T.'s criticism of the local venting practice, we have so far never taken up this phase, but can promise that the subject will receive some consideration in the near future. However, we can only say that this local venting, too, is carried too far altogether. It is scandalous to think of placing a small local vent in a single bathroom except when connected to a heated flue. Of course the practice really originated with sanitary engineers trying to cater to the fancies of the public, and then crept into various by-laws as a necessity. It is a matter of opinion to some extent. One reason why the local vent has become so universal is because of the many bathrooms installed in apartment houses and hotels, which rooms were generally closed tight in winter time. Also, a great many of these bathrooms were and are being connected to a light shaft which is only open at the top. Just as the practice of backventing is being overdone irrespective of conditions, so is local venting. There are scores of cases where local venting is necessary and when we take this matter up fully we will show the why and wherefore. But if we review the work done by our own craft years ago and then ask ourselves what we are doing to better conditions, we will very soon find out where the weakness lies. We know of several little towns whose Boards of Health are now considering the advisability of modeling by-laws, and when such is being done, the word of the craft is "mum." They allow all sorts and conditions of men to be appointed as plumbing inspectors, and then when poor work is done and the "cheap Jack inefficient" plumbing inspector passes the work of a competitor there is a howl. Now the howl should be unanimous before the non-practical man is engaged. Sanitary engineers should be the first to voice the necessity of plumbing by-laws. They should adhere to those by-laws to the letter, or see that the letter is practical. We all know that what was felt to be practical several

No doubt he's right, but his complaint reminds the writer of the conversation which took place between the member of a Scotch church and an elder of the same persuasion. Says the elder, "D'ye ken, McTavish, that there's an' awfu' lot o' the members o' the kirk gang to sleep during the sermon. I counted seventeen the tether Sawbath morn, ye ken, an' our Meenister preaches guid sarmans, tee. The folk that dee gang tae sleep never wakens tae the collections ower." "Och," replied the member, "I've na doot the sarmons are richt, but the folk are no to blame. Some folk can be talked to sleep, just as some can be rockit to sleep, but what's wanted is mair life in the sermons, and if ye ever seen only mair folk gaung to sleep, just



are conditions when vents and back vents are required, and it is up to the practical men in the trade to see that their by-laws are brought up-to-date at least every two years.

We would like to know of any city which has changed its by-laws re the



ye gang and stick the wife's hairpin intil the meenister."

So it is with sanitary engineers and boards of health. If you've got a sleepy board of health, "waken up" yersel; it's no their fault, ye ken.

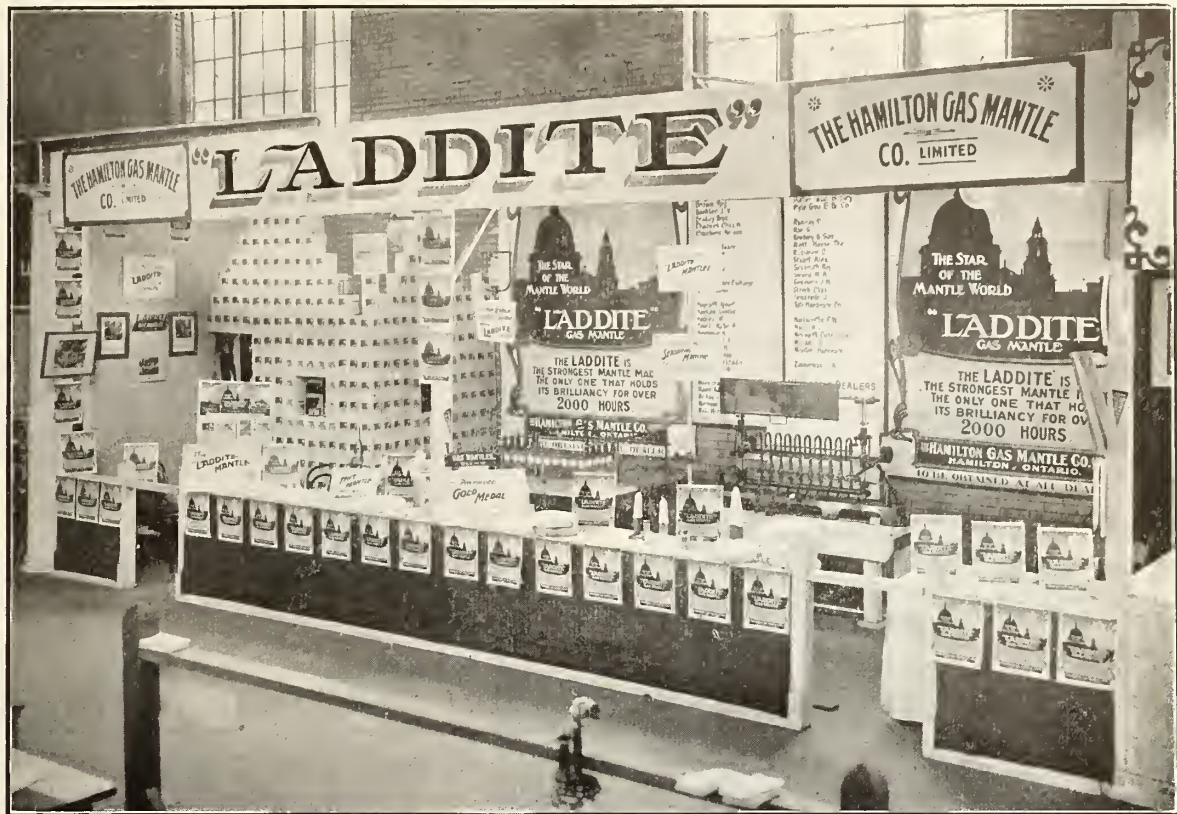


Exhibit at the recent Hamilton Exposition.

The Manufacture of Gas Mantles in Canada

Written for Sanitary Engineer by J. H. Ladd, of Hamilton Gas Mantle Co., Hamilton, Ont.

THE manufacture of incandescent gas mantles is practically a new industry in Canada. Heretofore dealers and consumers have had to rely chiefly upon foreign makes, upon which there is a duty of 30 per cent. The retail proceeds from the sale of gas mantles in Canada amounts to upwards of \$1,000,000 per annum, and it is said that the consumption of gas mantles in Canada foots up to five million mantles per annum. At the request of an editorial representative of Sanitary Engineer, who recently visited and inspected our plant, I will endeavor to impart to the readers of Sanitary Engineer some information regarding the interesting process of manufacture through which the mantles pass.

For many years after the introduction of the incandescent gas mantle by Dr. Aur, of Welsbach, Austria, the foundation or knitted fabric of the mantle was made from cotton and is still largely employed by some manufacturers, but since the machinery for the treatment of the ramie fibre (a grass which is grown in India) has been perfected, the ramie has superseded the cotton in the factories of Great Britain

and Germany, this fibre having been found far superior for mantle making, due to its long fibre and consequent regularity in spinning.

The first process in the mantle factory is the knitting of the ramie yarn by spe-

cial machines, which makes it into tubular form of about thirty yards in length, the width being regulated by the number of needles employed on the machines.

(Continued on page 29.)



Testing machines in the "Laddite" gas mantle factory.

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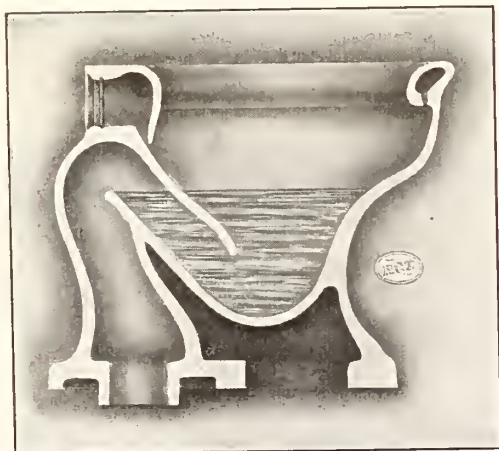
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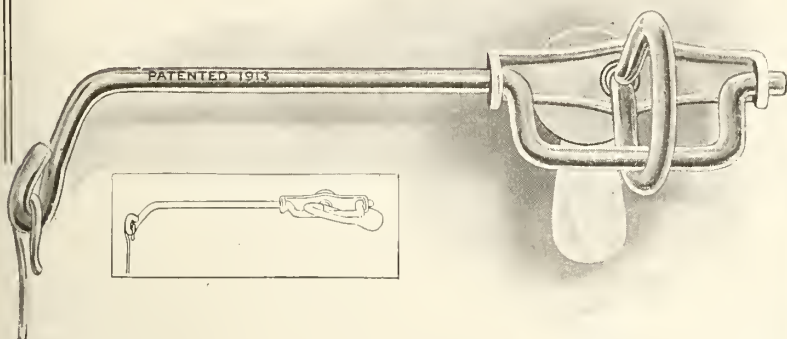
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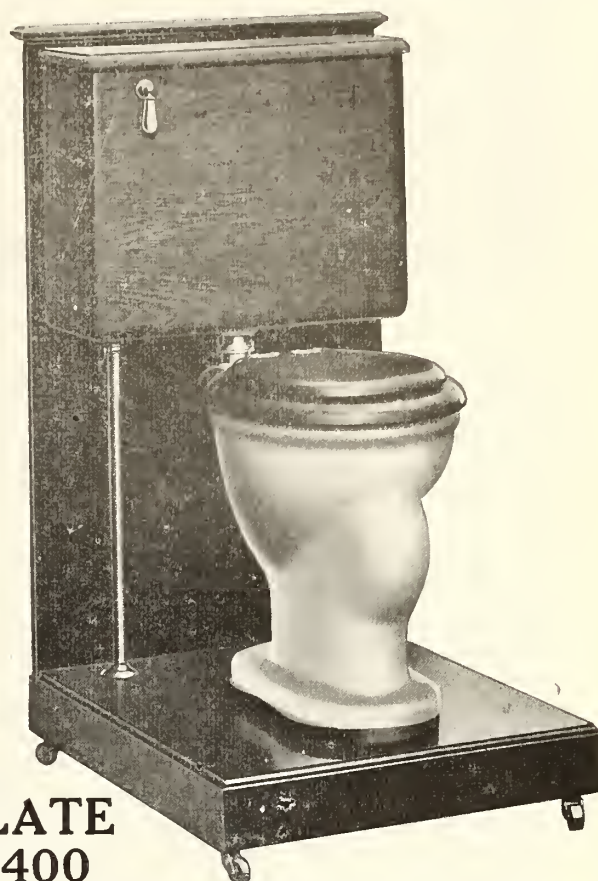
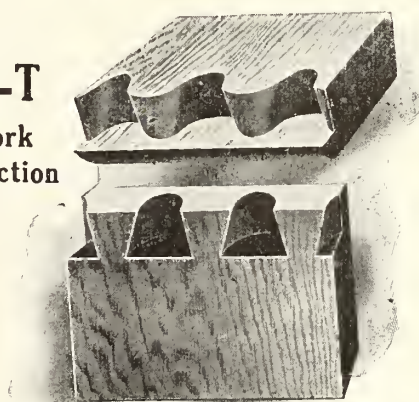


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TORONTO, AUGUST 15, 1914

WAR AND BUSINESS.

THE war clouds that have been threatening Europe for years have broken with startling suddenness and in tremendous volume. What the outcome will be no one can predict. It is enough to say that the destiny of nations hangs in the balance.

Neither can anyone speak authoritatively with regard to the financial situation consequent upon the war, for, like the war itself, it is a situation entirely unprecedented in the world's history. Canada, although fortunately situated geographically, is, nevertheless, so closely involved as a part of the British Empire as to make the effect of the war upon the business of this country a matter of the most vital concern. Without attempting to minimize the seriousness of the situation or the generally acknowledged need for retrenchment and economy wherever possible, we feel constrained to warn our readers against being unduly alarmed. We will display greater wisdom and accomplish most if we face whatever is in store for us calmly and courageously instead of with pessimism and desperation.

Canada's position financially is essentially secure. The Government has already made provision—in giving reasonably leeway to chartered banks—that will aid materially in the carrying on of all legitimate business enterprises without serious embarrassment. Other steps will probably be taken with a view to putting into circulation a still larger quantity of legal tender, should this be necessary. The ability to readily make these practical provisions against possible injury to business is a tribute to the vast resources of this country and the Canadian banking system. Business men should respond to this confidence in Canada being shown by those at the head of affairs. Another fact for which we Canadians should be thankful is that our country is largely occupied with agriculture and the production of food. Because of this the war will not only cause us less inconvenience than would otherwise be the case, but our industries, being principally devoted to supplying the necessities of life, will be less seriously affected by financial stringency. Keeping these facts in mind we believe our readers will be justified in mixing an intelligent spirit of optimism and much thankfulness with the caution and patient waiting that will most naturally prevail at this time.

Needless to say, speculation and all unnecessary expenditures should be absolutely tabooed.

MANY KINDS OF WAR.

AT THIS period, when business is more or less in a demoralized state, we should keep cool, and interest ourselves in our stock and to some extent finance our business with the proceeds from the sale of stocks on hand. How many sanitary engineers can tell the extent of their stocks to within several hundred or even thousands of dollars? The writer has seen shops in such a state that it would be an utter impossibility to calculate the value of the stock on hand. Such a state of affairs is War, financial war, which brings either serious loss, or ruin to one's business. Such methods create war in our personalities. An untidy and ill-kept stock neither would, nor could, be conducive to one's mental peace. Such stock rooms are enough to turn the brain of the most sublime of beings. Therefore, "Clean up," "Paint Up." Cease creating war on our peace of mind, and thus face matters as they really are. Thread up the short pieces of pipe and see that these pieces are used on the next job and in that way finance your business in these days of war.



PRACTICAL EDUCATION FOR ENGINEERS.

WHILE it is true that technical schools in Canada have not reached the state of perfection attained by those in some foreign countries, few operatives make the best use of the advantages at hand. The school education at best can but teach one to understand that which he reads and observes. The man who expects a university, by some mysterious means, to transform him into an engineer, and the youth who depends upon the technical school to add to him the essentials of a master mechanic have both still to meet their keenest disappointments.

The best and most useful practical education is that which is gained by one's personal experience or which is learned from those nearest to practical work. This education is to-day the cheapest, rarest and most paid for. The price is application and self-sacrifice.

Nearly all reputable builders of machinery publish accurate instructions concerning the operation and sphere of usefulness of their machines which are gladly furnished the interested operative without cost. A great number also publish, at considerable expense, a well-edited and illustrated treatise dealing not only with the methods employed in connection with their particular product, but give a comprehensive exposition of the subject in general. These are also sent free upon application. Many manufacturers, among whom may be mentioned the larger makers of gears and gear machinery, publish text books

which are sold for the mere cost of publication and mailing.

How often we see an engineer spending a number of his hard saved dollars for a book which is so technicalized that he cannot understand it and which contains illustrations copied by the author from the manufacturers' publications which he probably obtained for nothing. The hustling operator now has his chance and he who makes use of his opportunities will always be the superior of his spoon-fed brother of the school.



IMPATIENT AMBITION.

THE ambition to achieve or attain to something beyond our personal status or even that of our ancestry or our fellows is of course laudable; the danger lies, however, in the attitude or temperament we bring to bear on the accomplishment of our ideal. It is easily apparent or should be to even a superficial observer that nine out of every ten individuals, to take a moderate estimate, wreck their prospects through impatience.

The exceptional capacity which we attribute to many of our most successful men in every sphere is to a large extent an erroneous inference, being based more or less on their standing after achievement without regard to the details of the individual career leading thereto.

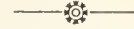
We are disposed to aver that there is little difference in the ability-to-succeed feature in individuals, but a huge difference in their patience make-up, and that this latter determines the ultimate result. Impatience is everywhere apparent, in business and out of it; the impatience to be boss, to shine and to get-rich-quick.

In our own country we need not cast around very much for examples of both. Our penitentiaries furnish a record of impatience that cannot be challenged, and if need be to emphasize this, there may be cited the case of one within its walls who typically exemplified his unrighteous desires in other directions by having great trees transferred and transplanted around his domicile instead of patiently waiting for young trees to grow.

Fortunately, we can also lay claim to shining examples of the virtue of patience, and in this respect, Lord Strath-

cona and Senator Cox, both recently deceased, appear pre-eminent. These both attained to considerable wealth, but neither through transcendent genius or rush methods.

There is a right and a wrong way, a true and a false attitude which can be adopted to compass an ambition, and the right and true generally go under when impatience is the driver. To-day, perhaps more than ever before, patience calls for cultivation.



WHAT IS COST OF MATERIAL.

IN CONVERSATION with one of the craft the other day, certain figures showed that on a given job \$20 had been made. The material cost (?) \$30. Man's time cost (?) \$10, and \$60 had been received for the job. Let us analyse the "cost of material." Upon asking how the sum of \$30 had been arrived at, the writer was shown the invoice for goods amounting to \$30. Here is a big mistake. Members of the trade are too apt to call invoice figures the cost. Let us point out that such is not the case. The fact is such an amount is not even the first item of cost. The buyer must have ability to buy or he will not be in business long. That ability is worth something, and must be charged up to cost. There is telephone, insurance, buyer's salary, rent, taxes of every description, all of which must be added to cost. There is stationery, freight charges, time unpacking and other items which must be added to the invoice price.



COST OF LABOR.

THE same argument applies to the cost of labor. This man gave figures to represent cost of man's time, which was the actual amount of dollars he had paid his man and helper. The time book does not by any means represent cost of labor. There is a proportion of time lost every week which must be charged to cost. There is the foreman's time and where the owner of the business acts as foreman the latter's time must be charged to that of the man and helper. In this very instance the owner spent 4 hours on that particular job, making no charge for his time. Therefore let us not forget that neither the invoice nor time book gives us actual cost of either time or material.

INSPIRATION

IF there is an impulse toward achievement in you which mere dollars and cents do not promote, it is inspiration. To be inspired with one's calling or occupation is proof of one's success. If when we take up an occupation we were to view it with the idea of finding out all the possibilities in that occupation, all the good that could be done by us while carrying out our daily task, we could not help but be inspired. Inspiration works up one's enthusiasm. If George Stephenson had not been inspired with the great possibilities of the locomotive he would never have built the "Rocket." If George Westinghouse had never been inspired with the thought of how to control speed, he would never have invented the air-brake. If advertising men had never become inspired with the thoughts of the great possibilities in the advertising line, the great Associated Ad Clubs of the World would never become such a power in the business world as is the case to-day. Any person who failed to become inspired after hearing the splendid addresses given by various members of the Ad Clubs Convention can easily be classed as dead to the world. Inspiration in one's calling is exactly what the spark is to the gasoline motor. Without the spark all of the engine is dead. Of course, the engine can be propelled by means of a belt and would then be in motion, though not giving any power off. Just the same, just as many men work because of the dollars, to be inspired with one's calling is to work from the heart, just as the spark in the motor works from the inside.

E. N.

Press Opinions on the Postmaster-General and His Recent Conduct

THE ATTEMPT of Hon. L. P. Pelletier, Postmaster-General, to ascribe political motives to the opposition to his Postal Bill and to secure the co-operation of Conservative newspapers in making political capital out of the result, was warmly condemned by the C. P. A. Convention. The attitude of the press of Canada can be judged from the following typical editorial references which have occurred during the past month and the latter part of June:—

Pelletier Tries to Fool Mail Clerks

Times, Moose Jaw, Sask.

Hon. L. P. Pelletier, the Nationalist Postmaster-General in the Borden government, is now busily engaged in the endeavor to put on the shoulders of Liberal Senators the blame of his own failure to increase the wages paid to railway clerks and certain other post office employees. Having double-crossed these civil servants, Mr. Pelletier is now trying to "get from under."

At the recent session, the Postmaster-General introduced a certain piece of legislation which may roughly be said to be in two parts. One provided for wage increases for railway mail clerks and other employees; the other gave arbitrary power to the Postmaster-General to fix whatever rates he pleased on newspapers and other second-class mail matter.

Immediate exception was taken to this latter part of the Bill. Newspaper publishers, in particular, objected to a plan which would completely reverse the former practice and allow the Postmaster-General to exercise arbitrarily his own sweet will as to the postal rates which should be charged. The provision came in for much criticism in the Senate. Eventually, an amendment was made to the measure in the Upper House. Mr. Pelletier refused to accept the Senate proposal and killed the Bill.

But the Senate amendment had nothing to do with the matter of the wages to be paid mail clerks and other employees. The Liberals in the Upper House were ready that the provisions giving increased pay to these post office workers should become law. They offered no amendment whatever to the provisions relating to wages.

If Mr. Pelletier had been sincere in his professions of desire to obtain better pay for postal employees, it would have been an easy matter to have allowed the legislation to pass without the sections relating to control of postal rates, but with the other sections providing for increased wages for the clerks. But that was not Mr. Pelletier's game. The provisions as to wages were placed in the Bill simply and solely for the purpose of helping the Postmaster-General obtain the arbitrary power which he sought for himself. It wasn't the postal authorities whom Mr. Pelletier had in mind when he framed the Bill, but the interests of L. P. Pelletier and some of his political friends.

He played an insincere game with the mail clerks and now seeks to fool them again by a hypocritical mis-statement of the case as it is.

Spite

Times, North Bay, Ont.

The Postmaster-General has announced his intention of advancing the newspaper postal rates to an extent which we fear will put some papers entirely out of business. This arbitrary proposition is thought by many to be a bit of spite on the part of the P. M. G. against the press for the influence brought to bear against his attempt to have an Act passed to give him absolute control in postal rates. Why should a man seek for control of such an important piece of business. It looks like a piece of high-handed work and should be put down without a dissenting voice of the whole nation.

The Senate a Useful Institution

Economist, Markham, Ont.

The Senate recently amended and thus practically rejected another Government measure which has won for it the approval of the Press of Canada, irrespective of party lines. The Bill in question was one from the Post Office Department, dealing with matters of routine including an increase of salaries for some clerks. There was no objection to most of the clauses but when the Bill was well advanced in the House of Commons it was discovered that it contained a section which gave the Postmaster-General a new, and, many members thought, a dangerous power. The postal rate on newspapers is fixed by Parliament. The Bill proposed that hereafter the rates should be fixed by the Postmaster-General. This

was giving to one man an arbitrary power, a practice which does not accord with democratic Government, and the press of Canada are indebted to the Senate for refusing to approve of this part of the Bill. The Senate in this case has certainly well served the purpose for which it was created, to check hasty and ill-considered legislation.

A Would-be Autocrat

Calgary Herald, July 7.

The Postmaster-General of Canada is evidently determined to revenge himself upon the publishers of the country, and incidentally upon the reading public for the defeat of his Bill by the Senate. He had issued a circular in which, by force of illegitimate interpretation of the present Postal Act, he proposes to increase the postage on newspapers from 100 to 800 per cent., the smaller dailies being the ones that would most severely feel the new rate. In addition, the Postmaster-General has dug up an old regulation of the department, dating from fifty years ago, which he says he will use to impose a charge of one cent on every copy of every newspaper delivered by postmen in the cities of the Dominion.

The Postmaster-General evinces the disposition of a tyrant in his present attitude. If anything was needed to justify the Senate in refusing to place the power of fixing newspaper postal rates in his hands it is the spirit he shows in the circular just issued. Mr. Pelletier is evidently not the man to be trusted with a power so vital to a great industry and to the public at large.

The surprising thing is that Mr. Pelletier appears to have the endorsement of the Borden Government in his remarkable position. It is probably through negligence that the administration has permitted him to go so far in this matter. Mr. Pelletier tried to shove his Bill through Parliament without giving the Press Association an opportunity to discuss its details. He falsified the position of the press to his colleagues in the House of Commons. He misrepresented the press to the Premier. It would be well for the Government to check up Mr. Pelletier and to see that the newspaper reading public is protected against his activities, otherwise the Government will have to bear the responsibility for a course of action which will be resented alike by publishers of newspapers and by the public that reads them.

This subject is one which will engage the attention of the Canadian Press Association at its meeting in Toronto during the present week.

Designed as a Threat

Halifax Echo, June 27.

Mr. Pelletier's announcement to-day is designed principally as a threat to show the newspaper publishers what might happen and to give him a lever in compelling a readjustment of rates according to what are his ideas of what the traffic will bear.

The Department says the new rates will not go into effect until all the publishers have been duly notified. In reality Mr. Pelletier expects that the newspaper men will ask for a conference and that some compromise will be agreed upon. It is very unlikely that he will attempt to really enforce the rates, of which he has given notice to-day.

Pelletier's Double Cross

Recorder, Halifax, N.S.

An article of canned stuff is just now making the rounds of the Tory press, to the effect that the Liberal majority in the Senate has killed Mr. Pelletier's Bill for increasing the salaries of railway mail clerks and certain other post office employees. The objective of the article from the Ananias Bureau is of course to make these civil service men blame the Liberals for preventing the salary advance. The truth is that Pelletier himself killed the Bill and thus cheated the men out of their dues. That portion providing for the increase in salaries was altogether admirable, but along with this went a clause giving arbitrary power to the Postmaster-General TO FIX WHATEVER RATES HE PLEASED ON NEWSPAPERS AND OTHER SECOND-CLASS MATTER. The giving of such arbitrary power was objectionable in the extreme, particularly as it put the postage of newspapers entirely at the sweet will of a partizan head of a Government department. Under such a system it can easily be imagined what outrageous discrimination could be practised to the detriment of all fairness. No Cabinet Minister in the history of the Dominion could have been entrusted with such arbitrary powers, least of all the present incumbent of the Postmaster-Generalship. The Senate justly refused to allow this clause to go through, and Mr. Pelletier to whom the clause was the all important feature of the Bill, refused to allow the amended Bill

to pass. In other words, because he is not to be permitted to fix postal rates on newspapers, etc., at his own sweet will, he refused to allow a salary increase to a whole army of poor men whose salaries are inadequate to meet the tremendously high cost of living obtaining at the present time.

Another Senate Rejection

Journal of Commerce, Montreal.

The Senate, which was heartily abused by the Liberals in the early days of the Laurier Government when it rejected the Yukon Railway Bill, and just as heartily abused by the Conservatives when last year it rejected the Borden Government's Naval Aid Bill, has recently refused its assent to some Government Bills under circumstances which win for the upper chamber a large measure of approval from men of both political parties. The majority which rejected the Bill to recoup the Farmer's Bank depositors included many Conservatives, and the Senate's action receives warm approval in influential Conservative circles. Now the Senate has materially amended, and thus practically rejected, another Government measure under circumstances which are likely to win for the upper chamber, to a very large extent, the approval of the Press of the country, irrespective of party lines. The Bill in question was one from the Post Office Department, dealing with several matters of routine, including an increase of salaries for some clerks. To the greater part of the Bill there was practically no objection. But when the Bill was well advanced in the House of Commons the discovery was made that it contained a section which gave the Postmaster-General a new and, many members thought, a dangerous power. The postal rates on newspapers are at present fixed by Parliament. The new Bill proposed to provide that hereafter the rates should be fixed by the Postmaster-General. There was no reason for supposing that the present Postmaster-General would be more disposed than any other Postmaster-General to make exorbitant charges to the Press. But there was a widespread feeling, voiced strongly by the representatives of the Canadian Press Association, that the power was capable of being abused, and that there was no good reason why, in this case, Parliament should surrender its power to any Minister. In an effort to reach a compromise the Postmaster-General agreed to fix a minimum charge beyond which he could not go, and to make the rates, when fixed, subject to the approval of the Treasury Board, who were to hear the representations of any parties who might be dissatisfied with the Minister's decision. In this shape the Bill came back to the Senate on Wednesday.

The fixing of a maximum rate which the Minister could not exceed was, to some extent, an improvement. The appeal to the Treasury Board, however, was quite illusory. The Treasury Board cannot be made, in this public way, an effective court of appeal from a Minister's decision. In the routine work of the Board a valuable service may be done by imposing a check on the hasty action by a Minister. In that case the proceedings are practically of a confidential character. The world may never know that a difference has existed. The Minister, if he is wise, and if the matter is not of vital importance, will accept the judgment of the Board, withdraw his recommendation and readjust the business accordingly. It would be quite a different matter, however, to put the Board in the position of being obliged to publicly reject the recommendation of one of the Ministers. Under the British system there must be solidarity of action among Ministers in reaching decisions. Minor differences must be waived in order that a common ground may be reached. When the moment arrives for announcing a decision the Ministers must stand together. As they say one, so must they say all. A Minister may hold serious objections to what is being done, but if he remains a Minister he must be silent; he cannot be permitted to express a difference with his colleagues.

This well established and necessary rule of Cabinet Government makes it impossible to treat the Treasury Board as a public court of appeal from a Minister's decision. The Treasury Board is simply a committee of the Cabinet. It cannot be expected that such a committee will submit one of their colleagues to the humiliation of a public rebuke by rejecting a recommendation publicly made by the Postmaster-General. How far this situation was considered by members of the Senate we do not know. The Senate apparently seized upon the essence of the Bill respecting newspaper postage. The present law leaves Parliament to fix the rates. The Postmaster-General proposed to transfer that power to himself, with the limitations above mentioned. The Senate thought Parliament should hold fast to its power, and, therefore so amended the Bill as to provide that the rates fixed by the Postmaster-General should not take effect until approved by Parliament. This, of course, would practically leave the matter where it now is, and that apparently will not be satisfactory to the Postmaster-General. It is hardly probable that the Press of either political party will be inclined to quarrel with the Senate for its action in this case.

The Postmaster-General's Attempt to Establish an Autocracy

Canadian Railway and Marine World, Toronto.

On other pages of this issue considerable space is devoted to a Bill introduced at the Dominion Parliament's recent session, by the Postmaster-General in which a most barefaced attempt was made to give the occupant of that position even more autocratic powers than he already possessed, and to take from a large section of the people rights which should be inalienable.

We say deliberately, and without fear of successful contradiction, that a determined attempt was made to smuggle this Bill through Parliament, without at least two of the interests affected, viz., newspaper publishers and electric railway companies, being aware of its contents. It was not distributed to the press in the usual way, nor even to those who subscribe for copies of all Bills in order to keep posted. That the attempt to keep the contents of the Bill from those interested was deliberate, is proved by the fact that a person who wrote a permanent official of the Post Office Department on May 6, asking for a copy of the Bill (two days after it had been read a third time), received an answer from that official, dated May 8, stating that the Bill would not be printed until it had been signed by the Governor-General. This was an absolute untruth, as *Canadian Railway and Marine World* had a day or two previous to the date of that letter secured a copy of the Bill, and we cannot believe that the untruth was unintentional. We cannot imagine that a permanent official, occupying such a prominent position as the one referred to does, was unaware that it was necessary that the Bill should be printed before it could be passed in the Commons. When he gave the answer above stated, the Bill had not only been printed for submission to the Commons, but it had been reprinted as passed by the Commons, and for submission to the Senate. When the discussion on it opened in the Commons the Postmaster-General gave an evasive answer as to the effect of some of the amendments proposed, and anyone reading the official report of his remarks cannot fail to come to the conclusion that there was a deliberate attempt to deceive.

The rate of postage to be paid by newspaper publishers for the transportation of their papers has, ever since Confederation, been vested in Parliament. The objection to the Postmaster-General's attempt to take that power from Parliament, and confer it upon himself, is not a question of rates. The publishers object to it because they want stability, and because they do not want to be in the power of any one man, who could change rates as often as he might see fit, and who would have absolute powers of discrimination. Many of them particularly object to such powers being vested in the present Postmaster-General who has shown himself impervious to argument or reason, and they object to his successors, whoever they may be, having such power, but they do not object to paying a reasonable rate, to be settled by Parliament. The question of newspaper postage rates has been before the Postmaster-General for months. He had ample time to prepare a tariff and present it to Parliament, but he broke faith with the Canadian Press Association, and attempted to steal a power which no one man should possess.

This is not a political question. As soon as the contents of the Bill leaked out, protests from newspaper publishers all over Canada, irrespective of their politics, poured into Ottawa, but Mr. Pelletier treated them with absolute contempt. When the Bill first came up in the Senate, Sir Mackenzie Bowell, an ex-Conservative Premier and the ex-Government leader in the Senate, said: "Although I appear as a seconder, I do not approve of the Bill and I am not to be committed to it." The representations of the Canadian Press Association were presented by the chairman of its postal committee, P. D. Ross, who is a close personal friend of Mr. Borden, and is the proprietor of the *Ottawa Journal*, which is generally recognized as the Government organ at the Capital. The Managing Director of *Canadian Railway and Marine World*, Conservative though he is, joined hands with the other opponents of the Bill, and did everything possible to ensure its defeat, which was finally accomplished.

The Postmaster-General is trying to make political capital out of the action of the majority in the Senate. They simply granted the request of the Canadian Press Association, which was worded as follows: "Resolved, that the executive of the Canadian Press Association hereby respectfully appeals to the Senate to strike out of Bill 147 the clause empowering arbitrary changes of newspaper postage."

During the discussions on the Bill, and after its defeat, the Postmaster-General made several open threats against publishers and others who opposed it, and there is no doubt that if he remains in the cabinet he will have to be reckoned with again in connection with this subject. The Premier is now conversant with the facts. Believing as we do in his high-mindedness and absolute probity we cannot think that he can approve of such arbitrary methods, and we look to him to restrain his colleague.

Analysis of Can. Sanitary Engineering By-laws

Continuing the Above Series We Are Again Taking Up the Plumbing By-Law in Force in Fort William, Ontario Known as By-Law 1181 With Amendments.

In our last issue we finished dealing with clause 16. We will now commence with clause 17, which reads as follows:—

Clause 17.

“In buildings where two or more closets, or other fixtures are over each other, traps must be back-vented by ventilating pipes as follows:

Diameter of pipe	Number of Trap	Size and Diameter in Inches.
1¼ inches	1	1½ inch trap.
1½ inches	1 to 3	1¾ inch to 1½ inch.
2 inches	1 to 2	3 inch to 4 inch.
3 inches	3 to 4	3 inch to 4 inch.
4 inches	4 or more	3 inch to 4 inch.

Water closets in batteries shall be back-vented on the loop principle as follows:—Two (2) closets two-inch vent pipe, to four closets three-inch vent pipe, to 6 closets four-inch vent pipes. If more than six in a battery they shall be vented as the inspector may direct.

Four traps of 1½ inches in diameter shall be considered equal to one trap of four inches in diameter. Cistern overflows to be open to sight and lead into either bath or basin.

This clause as will be seen, deals chiefly with venting and back-venting. It is typical of all other city plumbing by-laws. It demands more than is necessary. If our readers will refer to an article which appears on another page entitled, “Poor Plumbing in Public Schools,” which is a criticism by one of our readers, he will see what “Sanitary Engineer” thinks re back-venting, and our correspondent too, takes the stand that there is too much venting, particularly of w.c.s in battery. Now we have stated many times before and we here once more say that we certainly do object, from an engineering standpoint to these unnecessary complicated venting methods. It is a waste of good material. It is a useless practice, as well as costly, and we venture to state, that if sanitary engineers would conserve on material, they could easily save enough time and material, to turn a loss into a profit on many a job. In our next issue we will show the difference between the amount of material, and at the same time show a far more useful and practical piece of engineering. It is all well and good to see that some traps are vented under certain conditions, but as we have stated time and again, it is useless to vent a w.c. on a top floor, or even

any of the fixtures providing they have a separate connection to the vertical stack, or even if several small sizes, say from 1¼ to 2-inch are connected into an horizontal 4-inch pipe, if the latter terminates as a vent to the roof.

The latter portion of this clause which deals with the overflow from the cistern, is very commendable. It shows that the

person or persons who assisted in compiling these various clauses, had an idea of the possible waste of water from such cisterns. There is enough water wasted in our Canadian cities at the present time to serve the necessary actual needs of a population of over twenty millions easily, and still we are satisfied to go on wasting. When overflow pipes are “out o’ sight,” they are generally “out o’ mind,” and we are sure if this portion of the clause is enforced, it will result in a great saving of water for the citizens of Fort William.

Clause 18.

Rooms in which urinals are placed must have impervious floors or safes placed under the fixtures, drained into a deep seal trap and be provided with an automatic or continuous flush.

This clause is very general and is to be found in almost any city plumbing by-law. It could be improved to some extent by specifying the number of urinals which could be fitted to one automatic flush tank, the amount of water and the number of times the tank would require to be flushed per hour. Failing some such specification, a great deal of water could be wasted, we believe every scheme known should be adopted to prevent a wanton waste of water. We do not mean that water should be saved at the expense of cleanliness by any means, but there is a medium in all things. This clause demands that such rooms should have impervious floors. “Sanitary Engineer” would even go one further and demand that all bath room and w.c. rooms be fitted with such floors, and also have the sides sheeted or lined with a water-proof siding, not less than 5 feet up from the floor.

The reason why we would advocate such, is because of the dampness of most bathroom floors, and the wet gets under oilcloth or linoleum, to some extent. Then dust collects and is dampened and rotting of the floor sets in and there is a filthy floor as a result. The filthy condition of many bathrooms to-day is simply due to some such cause as that of dampness penetrating the wood floors.

Clause 19.

Where slop sinks are used they shall have traps similar to water closets, and be ventilated by a pipe not less than two inches in diameter, one size smaller than waste pipe.

To prevent foreign matter entering the waste pipe they shall be provided with cross bar brass strainers. Either tap or cistern flush must be provided in connection.

This clause is general, it demands that the trap shall be vented and tap or cistern be fitted to it. No doubt if this fixture were installed in a kitchen it would need to be vented, and if it happened to be installed below other fixtures, we would advocate its being vented. But if on the other hand it were on a top floor and had a direct connection of its own into the vertical stack, we would not think venting necessary. The writer has visited hotels where a slop sink has been installed on every floor, with simply a hot and cold water tap over it, and unless the person utilizing that fixture allows the water to run, it is apt to become a filthy fixture. We would strongly advocate that either a flushing tank or a flushometer be attached to slop sinks when used in hotels for emptying slops from bedrooms.

Clause 20.

All fixtures such as baths, sinks, tubs, basins, etc., shall be properly trapped and ventilated. In cases of wash basins, one trap may serve for a range of four, waste pipe and trap to be N.P. brass and not less than one and one-half inches.

This is a general clause, and as we have already voiced the opinion of Sanitary Engineer on the venting of all traps irrespective of location, we will not dwell upon the subject again in this article, except in the case of tubs, which we infer, means laundry tubs.

(Continued on page 26.)

Septic Tank Installed Below Ordinary Level

Showing How Septic Tank May be Installed When Basement Requires to be Drained, or When Ground is Level and Tank is Not Installed Near the House—A Special Bed of Earth Must be Provided.

FROM time to time we have published articles on septic tanks, all of which were required to be built near to the house, or necessitated a mound of earth being thrown up to take care of the height of the tank, so that the irrigation tile pipe would not be buried lower than 14 inches below the surface, which distance is the proper limit, and will give the very best satisfaction. There are circumstances, however, under which it is almost an impossibility to erect such a tank. We, therefore, purpose showing how it is possible to place a tank and pipes at almost any depth. The sketch here shown will give our readers a fair idea how such an installation will look. First of all, we must determine the point at which the soil pipe is to leave the house. Then, allowing a fall of about one inch in ten feet until the tank is reached, we must decide what depth the tank is to be. This must be of the same cubic area as the tank would be if installed under the ordinary conditions. The cover must be fitted with a shaft, or large drain pipes will do so long as they are of sufficient size to allow of an ordinary person going down into the tank.

There should be a vent taken off at the tank, as shown, and another vent at the extreme end of the tile system. These should be of a length sufficient to prevent the snow from burying the open-

ing. The vent at the extreme end is provided so as to supply air to the bacteria which would in the ordinary system get their supply of air through the earth.

A bed of earth must be provided, in which the tile pipe is laid, and great care should be taken when making this bed. Each running branch of pipe should be at least 3 feet apart and laid perfectly level. About 18 inches of good earth, free from clay, should first be laid, then a layer of about 6 inches of gas coke. Next lay the 4-inch field tile pipes on the coke, and fill up to about 6 inches over the pipes with coke. Then a layer of good straight straw should be placed over the coke, and about a foot (not less) of good earth on top of the straw. The whole can then be filled up to the ordinary ground level. If such a system is required in sandy ground, the same method should be followed out. It should be stated, however, that instead of allowing about 13 feet of 4-inch tile pipe to every cubic foot of tank there should be at least 15 feet allowed. The reason for this extra two feet being required is so that at each flush of the tank the pipes will not be quite full and a free passage of air will be provided. The bacteria will be given a supply of air to begin with if the pipes are not filled to their total capacity. It will be seen that if there is barely enough pipe the bacteria are apt to get air only at

the extreme end vent. The vent at the tank will not assist them in any way, as it will be seen that the soil pipe stack will draw a supply of air through this vent, and in that way supply air to the bacteria in the first division of the septic tank. In conclusion, we must say that, while this system has been working for several years in different parts of the country, we much prefer to keep the tank higher up and place the tile pipes not less than 10 inches and not more than 14 inches below the surface of the ground.

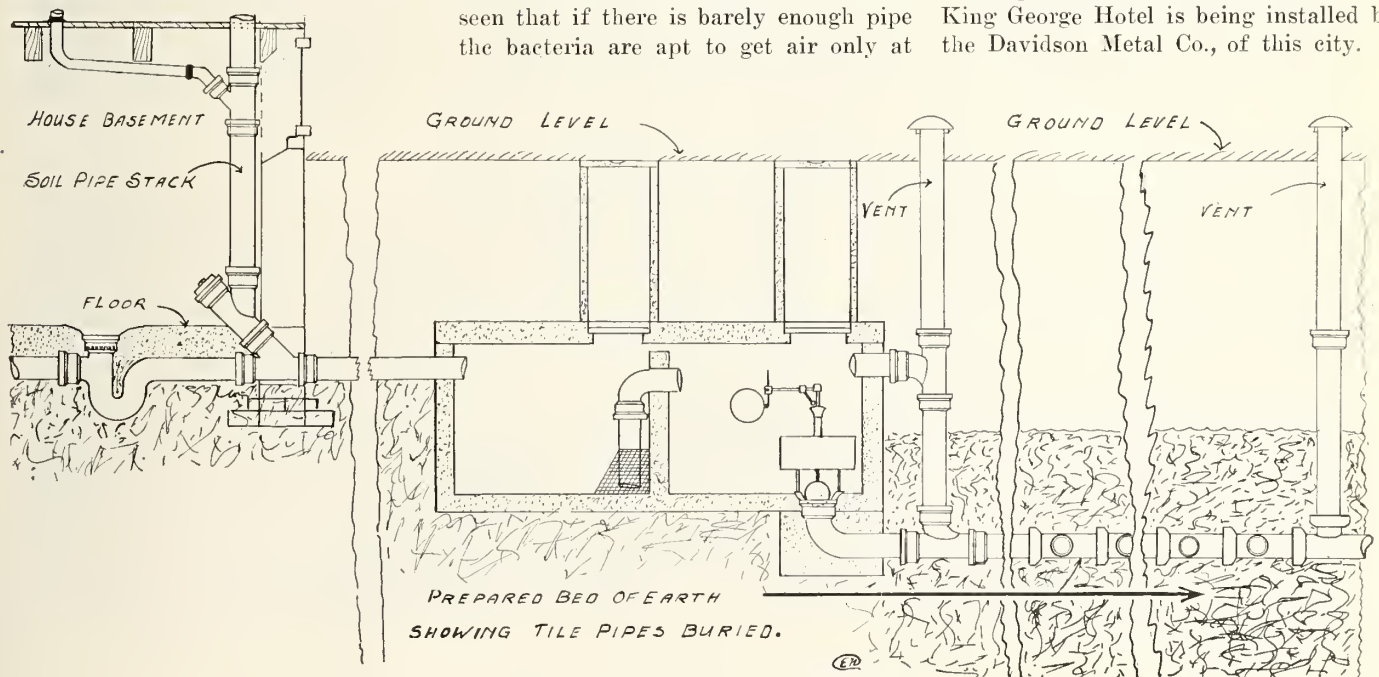


Doings in Lethbridge, Alta.

The Standard Plumbing and Heating Co. has been awarded the contract for the heating, plumbing and ventilation of the new Roman Catholic School. The heating system is a one-pipe steam with automatic control. The ventilation is by means of a motor-driven fan. The same firm is installing the plumbing and heating at the new Mormon Church now in course of erection.

The Dominion Building and Post Office is approaching completion, and the Kelly Heating and Plumbing Co., of Calgary and Winnipeg, are busy installing the plumbing fixtures and radiators.

The plumbing and heating of the new King George Hotel is being installed by the Davidson Metal Co., of this city.



Septic tank installed below ordinary level.

New Sanitary and Heating Goods

SQUARE END PIPE CUTTER.

IN placing this new 2½ in. to 4 in. pipe cutter on the market the Borden Canadian Co. of Toronto have made a radical departure from the standard design of pipe cutting tools.

The tool consists of two sections, the gripping part, which when in operation

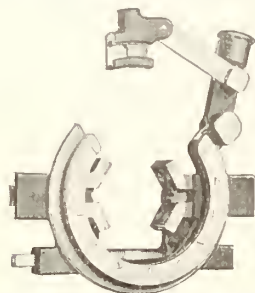


FIG. 1. PIPE GRIPPING SECTION A.

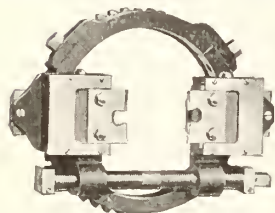


FIG. 2. CUTTING SECTION B.

ing surface upon which the cutting section revolves.

Fig. 3 shows the assembled tool. When the jaws are clamped to a pipe they automatically center the cutting knives so that the pipe is cut off square. As the cutting is done by means of a ratchet, pipes may be cut off in cramped places which would otherwise prohibit the use of an ordinary tool. One man can work the pipe cutter to advantage. In fact, the tool, we understand, is

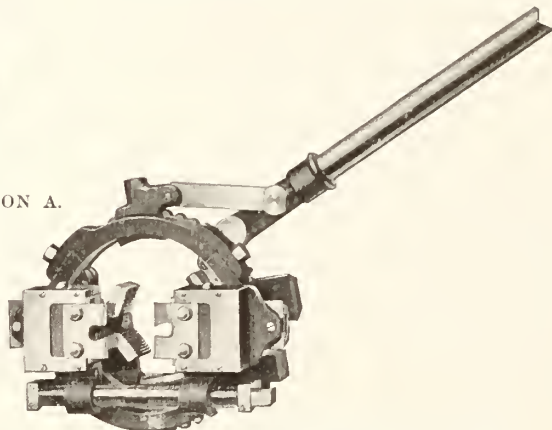


FIG. 3. 2½-4 IN. SQUARE END PIPE CUTTER.

has no motion relative to the pipe, and the cutting part, which revolves about the latter. Figs. 1 and 3 show these two sections respectively. To cut off a piece from a pipe, the first operation is to clamp the tool to the pipe. In Fig. 1 the gripping jaws seen are closed by a right and left hand grip screw which is operated by a wrench fitting over its square end. In Fig. 2, showing the cutting section, a similar right and left hand screw sets the knives up against the pipe under tension. The cutting section has a ratchet fitted to it, and by means of a handle fitted into a link on the gripping section, the cutting part is thus made to revolve about the pipe, being actuated through the lever and the ratchet. The knives are fitted with little blocks, and when placed up against the pipe under tension, coil springs behind these blocks are compressed and keep the knives uniformly against the pipe as the cut proceeds. The knives are so shaped that part of the cutter forms a guide which allows the feed never to exceed that for which the cutter was designed. The springs pressing against the little blocks keep the tool always cutting; thus when once set against the pipe the feed is automatic and constant. The tool is a complete unit of cast steel, and a bronze bushing is provided for a bear-

capable of cutting off a 4-in. pipe in four minutes by a man using one hand only. The cut is particularly clean, there being a conspicuous absence of burrs inside and outside. There is, further, little tendency to strain, distort or split the pipe, while the cutter can be quickly adjusted to fit any size from 2½ in. to 4 in. The tool will also cut through a thread as quickly and squarely as a piece of straight pipe.

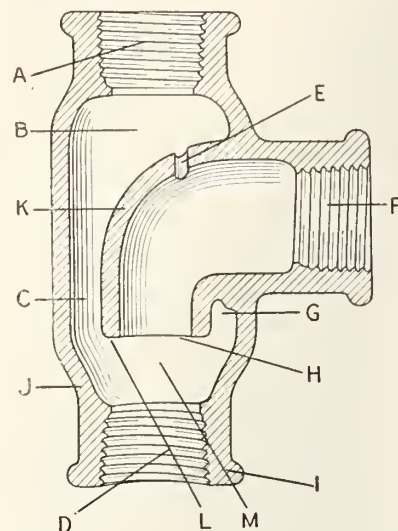
Two extra sets of cutters are supplied with each tool and also a template for grinding. The knives are easily and quickly removed by simply taking out two cap screws. There are practically no parts to get out of adjustment.

NON-BY-PASS ELBOW.

The James Morrison Brass Mfg. Co., Ltd., of Toronto, are making what is known as the Stack non-by-pass tee, and is practically one tee inside another tee. It is so designed that the water passing by, and through the various points forms a resistance or balancing action on the water from the heater, thus preventing the movement of the water through the heater except by gravity circulation (which is when the heater is in operation). Any other movement through the

heater except by gravity circulation is stopped by this balancing action.

This special form (riser and run pattern) is made to be applied to the piping near the boiler.



A—Outlet from T to hot water line to fixtures.

B, G, and M—Water chamber around circulation elbow inside T.

C—Clearance passage between wall of T and circulation nipple in T.

D—Inlet connection for hot water from boiler.

E—Drilled opening to prevent syphon or air pocket.

F—Inlet to boiler of circulation water from heating appliance through T.

H—Outlet of water from boiler through T into fixtures.

I—Shoulder on fitting.

J—Water chamber widening to allow of ample circulation through T.

K and L—Natural curve of circulation water to throw same directly into boiler.



SANITARY ENGINEERING BY-LAWS.

(Continued from page 24.)

In an article on simplified plumbing which appeared some time ago we referred to this subject, and again in an editorial, showing how, if laundry tubs were not connected to the drain, they would not require venting, we do not see any need to connect this fixture to the drain if it is situated in the basement. Of course if it is situated in a kitchen or laundry room, where there are other fixtures above it, other than in the basement it would require to be connected to the soil pipe stack and in that case back-venting would be necessary.

Winnipeg Sanitary and Heating Engineers Picnic

The First Annual Picnic Was A Great Success, And Well Represented By All Branches Of The Trade, Over 400 Being Present, Including Sanitary Engineers, Their Families, Inspectors And Supplymen.

WHEN the Winnipeg domestic sanitary and heating engineers assembled to take the train for their annual picnic on Thursday, Aug. 6th, it seemed as though a good part of the city had proclaimed a holiday. Four big electric cars were required to contain them, and even then some of them were left behind to take the next car, and some came in automobiles.

Shortly after one o'clock the train was made up, and sped at a good clip in the direction of Selkirk, where the picnic was to be held. On the way, the members of the craft renewed acquaintances, and it soon became evident that it was a splendid thing that for once in a year they could come together and have a good time, leaving the cares of

business behind. The ever-present supply men were there too in good numbers, and they were heartily welcome.

This was the first annual picnic of the Domestic Sanitary and Heating Engineers' Association, a body which has been in existence only two years. Arrangements had been perfected by a committee composed of the following:—G. A. Hamilton, chairman; C. H. Wagner, L. Stephenson, F. Archibald, K. Koffman, G. Gossling and G. Whitfield. To them is due the credit of arranging a series of enjoyable sporting events, a real good supper, and transportation to and from Selkirk.

A Fat Man's Race.

The ancient Manitoba city was reached in less than an hour, and a stop was

made for a few minutes in the main thoroughfare. Someone espied the chief of police trotting down the sidewalk, and shouted to him that they were going to have a fat man's race, and to come along. The chief, being a fat man, smiled, waved his baton, and beat it. (Not the baton.) Then the cars began to glide under Selkirk's shady trees towards the park grounds, where the party alighted. Preparations were at once made for the sporting events.

The first event passed off so quickly, the representative of Sanitary Engineer did not see it. The fastest ones were Fulton, Krasnikoff, and Wagner, in the order named. Then came the 75 yards race for ladies. Again our representative did not see it, except through his



(1) Children waiting signal to start. (2) Plumbers' wives and children. (3) At the crack of the pistol. (4) Heavy-weights about to start (L. Stephens in front). (5) Girls under 16.

camera, where the ladies looked like little pieces of flying silk and lace. Those standing around said it was a corker. The winners were, (1) Miss M. Orr, (2) Miss C. Toole, and (3) Mrs. Gate.

"Gells" Under Forty.

All this while L. Stephenson was running up and down the course, calling upon first the sanitary engineers and then their wives, not to be afraid, but to come forth and run. At the same time Hamilton was shouting something at the top of his voice about "gells over twelve and under forty." Through the Sanitary Engineer camera it always seemed as though "gells" were running. "Gells" under 16 came out in this order—Miss Morton, Miss Archibald and Miss Brickman.

When the married ladies' 50 yard elip came along, it looked for a time as though the race would have to be suspended for a year until the fashions changed. As the writer saw most of the races through the peep in his camera, it was difficult to tell whether this one was a sack race or an obstacle race. When he looked up, the following had somehow reached the tape line—Mrs. Gate, Mrs. Stephenson and Mrs. Coates.

Long before the races started, it was rumored that L. Stephenson would be a contestant in the heavy weights race, and there were fat men who objected on the ground that he was not fat enough and that he was a professional. Some suggested that he be put on scratch. However, no action was taken, with the result that he left a series of heavy-weights in his trail, and was across the tape before some of them had got started. W. L. Helliwell, manager of the Gurney Foundry Co., Winnipeg, came in second, but it was such an exertion, it looked for a while as though Gurney's would require another manager temporarily. Mr. Fraser got in third.

"Watch That Gentleman."

There was a race for babies, whose ages appeared to range from one to five. One little tot dressed in blue had not been long out of her cradle. They gave her a start of about two inches. She stood there with some other mites, with their thumbs in their mouths. One old fellow felt so sorry for the kid in blue, he bawled, "Watch that gentleman drop the handkerchief." Then everybody shouted, "Watch that gentleman." When the handkerchief did drop, the others ran, but the kid in blue still stood looking for the gentleman. She never ran an inch.

The Gates must be a running family. Mrs. Gates was a victor in two races, her baby won first prize, and her two girls won first and second prizes in the 50 yards races for girls under eight. In the ladies' consolation, Miss Gladys Mount

came in first, and Miss A. Gossling second.

The 100 yards championship handicap, for supply men only, proved that these gentlemen can do some hustling when they try, and was one of the best events of the day. J. A. McLaren, of the Galt Brass Co., came in an easy first, followed by Ed. Jennings and H. G. Taylor, of the Dominion Radiator Co.

Gave Sam a Start

Then came the 75 yards for inspectors. It was arranged that Sam Coop, who is getting on in years, and not so slight as some of the other boys, be given a start of twenty-five yards, but there was a storm of protest, some claiming that he ought to be put behind the others, as he was an old one at the game. When the pistol was fired, William Todd got the lead, followed closely by James Smith, and E. Samson, third.

The other races included, 50 yards, girls under 8. Winners—Gracie Gate Rose Gate, and Bernice Josie. Girls under 12—Miss Iris Orr, Doris Mount, and A. Wellbridge. Boys under 12—Stephenson, Koffman, and Samson.

The crowd then moved up to a point where the wives of the sanitary engineers were showing off the fine points of their babies. Two ladies were appointed judges, and James Smith, chief inspector of Winnipeg, took it upon himself to tell them which he thought were cutest. The result was, 1 to 2 years, Harold Gate, Baby Lamson, and Jessie Hamilton; under one year, Baby Hudson, Baby Stephenson, and Baby Hamilton. In the fat men's race, the winners were Hilton, Rodway and Koffman.

Supply Men Victors.

The crowd then moved in the direction of the baseball game, the supply men being pitted against the sanitary engineers. It was not the kind of game you would pay a dollar to see. The batteries were, Wagner and Fraser for the sanitary engineers, and Bakemeyer, Golden and Taylor for the supply men. Taylor made two runs, Bakemeyer two, Golden one, and Thompson one. Archibald was the only one to score for the sanitary engineers. The supply men winning by 6 to 1.

Preparations were then made for the final event—the tug of war, with inspectors on one side, and supply men on the other. They were photographed before trying their strength. After several pulls had been pulled off, and several sanitary engineers had craftily given the rope an added pull in the direction of the inspectors, the latter were declared victorious. That concluded the games, and before supper, the distribution of prizes took place from a wagon. On the program it had been stated that prizes in most events would consist of

the "glory of victory." Those who did not run extra hard with the idea that satisfaction would be their only reward, were painfully surprised when the prizes were handed out. A group of inspectors, who had assembled to have their pictures taken by J. A. McLaren, of the Galt Brass Co., got tired of waiting, and found him gloating over a case of pipes which had been handed to him as a prize. James Smith nearly turned a fit when he opened his package and found a five dollar razor. When it was all over, there were sufficient children's dolls left to start a toy shop.

Many of the supply men beat it when they had got their prizes nicely stowed away, but the majority of the members, wives, and children stayed to partake of the lovely supper which had been put up for them. This was supplied by a caterer on the grounds. After supper, quite a number of the men walked into Selkirk, for what reason nobody seemed willing to suggest. They joined the party when the cars started on their homeward journey at 8.30.

Supply Men Present.

Those representing the trade included, Robert East and Lew White, of the James Robertson Co.; Frank Lamson, of the J. H. Ashdown Co.; Walter J. Fulton, Ed. Jennings, and H. G. Taylor, of the Dominion Radiator Co.; E. B. Plewes, and W. L. Helliwell, of the Gurney Foundry Co.; Fred Thompson, William Buchannan, and C. R. Watford, of Crane & Ordway; J. A. McLaren, of the Galt Brass Co.; Galt; W. G. Garrett, of the Canada Metal Co.; H. Hilton, of Hilton Bros.; Frank Murdock, of the Vulcan Iron Works; Norman T. Cronkhite, of the Cronkhite Co.; H. Bakemeyer, of the Canadian Wolverine Co., and Percy Golden, of the Good Mfg. Co., New York.

James Mackie, president of the association, gave everybody the glad hand, and superintended things generally.

PICNICKETTES.

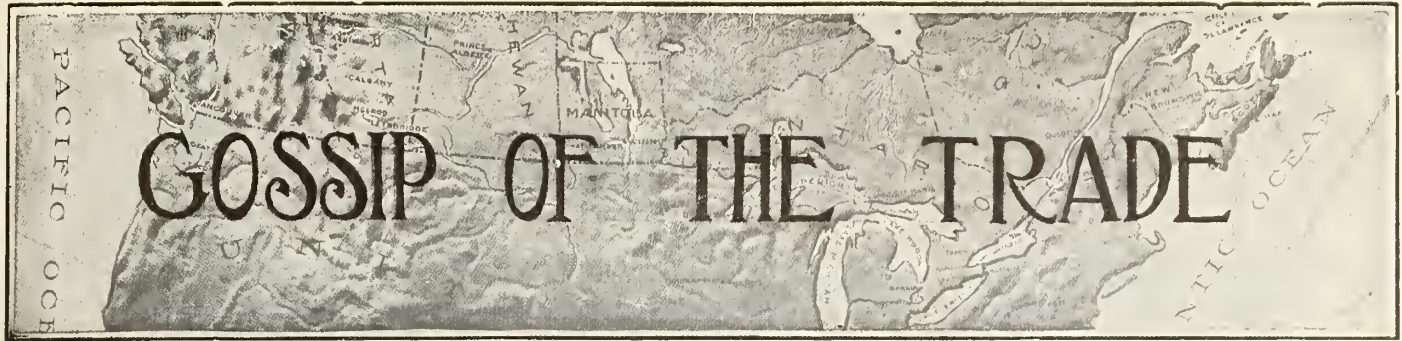
At the baby contest there were some fine kiddies, "bleeve me." Sanitary engineers compare favorably in this with other trades.

E. B. Plewes tried to hide himself when the fat man's race was pulled off. When he goes to a picnic, he goes to enjoy himself, he says.

It was surprising the number of supply men there, and the enthusiasm they showed. Someone remarked that this was part of their business.

Some surprise was expressed that L. L. Anthes was absent. Most likely he was out of the city, for he likes to be with the boys. (See report of convention of Institute of Sanitary Engineers held at Edmonton.)

(Continued on next page.)



New Establishment.

Messrs. Rosid & Farley have started a sanitary and heating business in Kerrobert, Saskatchewan.

Newly Appointed Secretary Treasurer.

Editor Sanitary Engineer.—I wish you would make this a special announcement through your journal, that Mr. Crawford, who was elected secretary-treasurer at the national convention, has found it necessary to resign from the position and that Mr. L. H. Estano, of Moncton, has been appointed to this position by the executive. Mr. Estano has been secretary-treasurer of the Moncton local since its organization in 1911, and was one of the live wires in the organization of the Provincial Association, and makes a capable and painstaking officer. The Canadian society is fortunate in securing the service of Mr. Estano as secretary-treasurer, and he will no doubt make a good showing for the association for 1914-15.

Yours very truly,

Geo. A. Dorman,

President, Canadian Society of Domestic Sanitary and Heating Engineers.

Bubbly Cup in Mine.

Few people associate mining and sanitation, but in the Oliver mine, in the Lake Superior district, the two go together.



For the convenience of its miners the Oliver mine established bubbly fountains of the most improved type, and, more than that, concrete and steel reinforce-

ments replace the ordinary timber to prevent a cave-in.

New Business Established.

Messrs. Warren & McDonald have started a sanitary and heating engineering establishment in Yorkton, Sask.



THE MANUFACTURE OF GAS MANTLES.

(Continued from page 17.)

The fabric as it comes from the knitting machines is submitted to a bath of certain acids in order to eliminate all impurities, natural or otherwise; it must be rendered chemically pure before treatment with the nitrates forming the composition of the finished mantle.

After careful drying of the washed web, it is impregnated with the usual nitrates common to all makes, but to which is added a new element known only to the discoverer of the "Laddite" process.

This new element prevents the vaporization of the light-giving nitrates, greatly prolonging the life of the mantle and rendering it very tough, so that it can be readily handled without fracture after it has been burnt off.

To proceed with the process of manufacture. Following the impregnation of the web is dried by a blast of hot air, after which it is cut and sewn on machines, according to the various designs of mantles required. The sewn webs are then submitted to the action of high pressure gas for the purpose of burning out the ramie fibre, thus leaving the ash only of the nitrates now converted into a metallic oxide. This is again submitted to a high pressure flame, which shapes and hardens the mantle. The mantles are then dipped in a solution of collodion, forming a stiff coating, and which prevents breakage in transportation.



The good merchant measures his progress by his net profits, not merely his turnover.

The merchant who does not take time to read his trade paper is usually more interested in something apart from his business.

WINNIPEG SANITARY ENGINEERS' ANNUAL PICNIC.

(Continued from page 29.)

H. G. Taylor, of the Dominion Radiator Co. hurried home from a western trip to take in the picnic.

J. A. McLaren, manager of the Galt Brass Co., happened to be in Winnipeg at the time, and was present on the ground with his camera.

The supply men excelled at baseball, but when it came down to a test of muscle, they compared badly with the inspectors. See tug o' war results.

Frank Lamson caused quite a sensation when he arrived on the grounds in the big yellow Ashdown car, with a large Union Jack in the rear.

James Smith, chief inspector of Winnipeg, said he had never seen so many sanitary engineers in Winnipeg before. There were about four hundred counting men, women and children.

W. L. Helliwell, of the Gurney Foundry Co., was so hoarse with running in the races, when he called for three cheers at the close of the baseball match, nobody heard him.

Charlie Wright, of the J. W. Wright Co., C. H. Wagner, of Cotter Bros., William Brick and James Mackie were among those who motored down.

St. Boniface was well represented, the party including W. Fairley, plumbing inspector, and the ubiquitous Dick Smith.

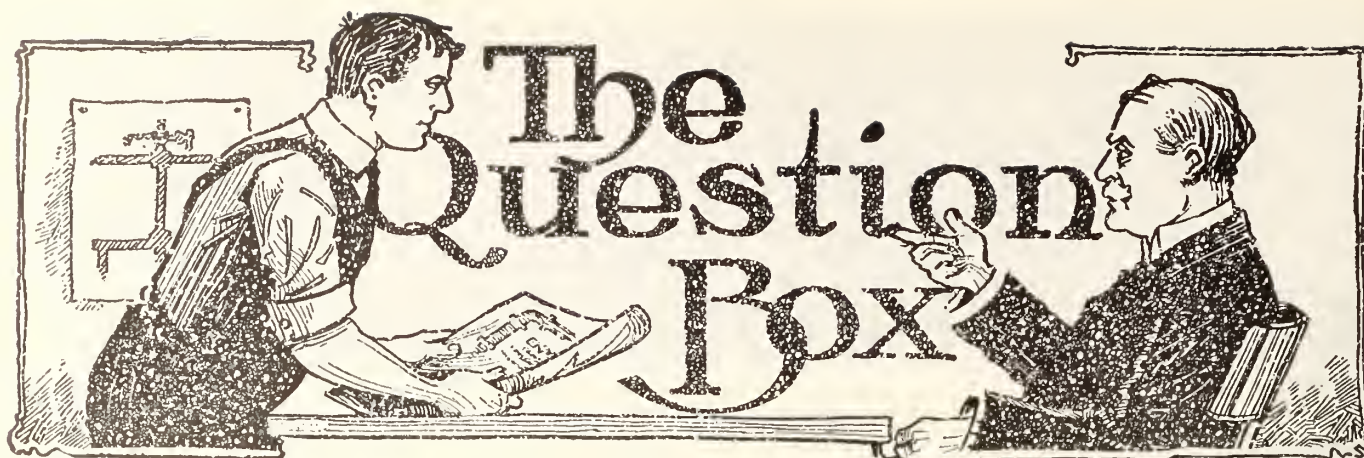
L. Stephenson was asked if he was an inspector, and somebody said, "No, he is an expector." Prospector would be a better term for plumbers in Winnipeg just now.

Sam Coop, the veteran Winnipeg inspector, disappeared suddenly before supper was served, causing considerable anxiety.

Many remarks were passed on the good-looking wives possessed by some of the Winnipeg sanitary engineers.

James Smith brought his two boys along with him, one of whom he said was the future inspector of sanitary engineering for Winnipeg. "Let-Soap-so."

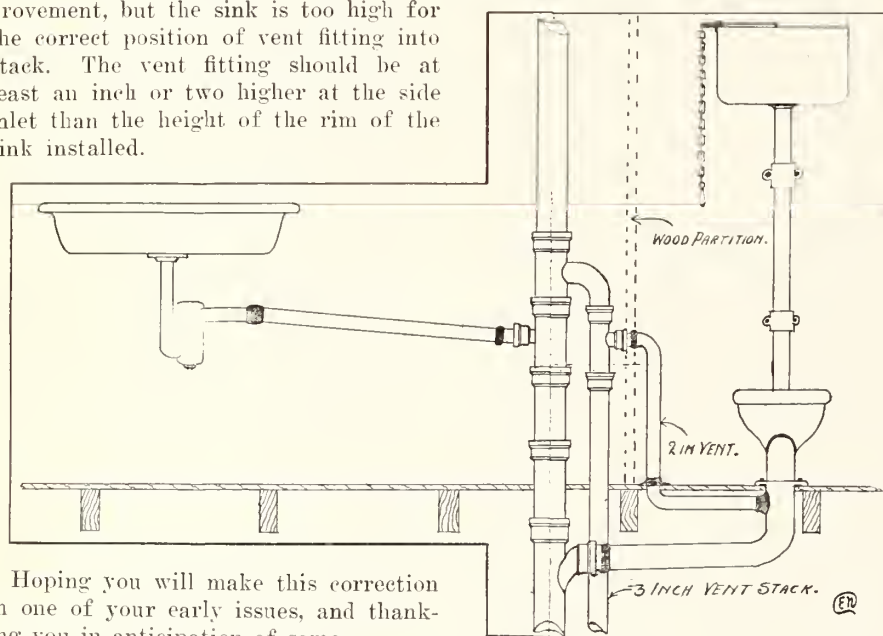
Judging from the quality of prizes given away and the fine supper which was served, the Domestic Heating and Sanitary Engineers' Association of Winnipeg must be in a healthy condition.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

Sink Too High for Vent Fitting.

Editor Sanitary Engineer.—Whilst perusing your July 1st number of *The Sanitary Engineer*, I note your remarks re illustrations on page 23. The first illustration is of the plumbing work installed incorrectly, whilst No. 2 is correct. I beg to state that No. 2 is not quite correct, although a decided improvement, but the sink is too high for the correct position of vent fitting into stack. The vent fitting should be at least an inch or two higher at the side inlet than the height of the rim of the sink installed.



Hoping you will make this correction in one of your early issues, and thanking you in anticipation of same.

I am, yours truly, and a regular reader of your paper.

P. ATKINSON.

Saskatoon, Sask.

We have taken the liberty to reproduce the illustration referred to, and at the same time must refer to the article. This was a case where certain plumbing was installed on a top floor, and, therefore, the sink in question does not require to be back vented. Our correspondent, of course, takes it for granted that it should be vented, and, therefore, claims it is too high, etc. It may require to be vented according to certain

plumbing by-laws, but *The Sanitary Engineer* takes the stand that in this case venting is not necessary. We also take the stand that 60 per cent. of the venting which is demanded by certain cities is not necessary when the work is either on a top floor or in a single or double house, and where there is only one or two bathrooms on the same floor. Our

that it takes a good practical man to know when and when not to vent a trap. It is this wholesale venting which allows so many incapable men to be practising in the trade, simply because the latter have no knowledge as to when to vent and when not. All they do is conform to the by-law. Any fool in the world can follow out a command, but it takes a man of thought and brains to know when and how to disobey one. This profession of ours requires men with more initiative. We have all learned by our mistakes. As one great writer expressed it: "The man who never made a mistake never made anything else worth a damn." We have been mistaken with this policy of wholesale venting; therefore, let us look at the question squarely and learn by our mistakes.—Editor.

Auxiliary Heating System.

Cases often arise where a house is built long and narrow, and it is necessary to adopt some other kind of heating, particularly in a home where in the first instance a warm air furnace has been installed and where it is found that some of the rooms which are a long distance from the furnace, do not get sufficient heat. In such a case, the warm air furnace may be made into a combination of warm air and hot water, by installing a coil or cast iron heater in the fire box of the furnace and placing a coil or radiator in the rooms where heat is required, the stack pipe can be used to run the piping up to the desired floor, etc. Another method, too, may be adopted, viz:—That of a separate system by using a gas water heater as shown in Fig. 4. There is nothing novel in the installation and it is simple to install, the higher the expansion tank is placed from the heater, the quicker the water will circulate, such installation is

correspondent must also note that we produced a deep seal trap under the sink, because we were given to understand that the sink is only about three feet away from the stack. If our readers will give this problem of venting a little more consideration they will find that, while some by-laws demand all traps should be vented, it is no proof that such a practice is good engineering, and the day is not far distant when we, as a craft, will sit up and take more interest in these things. And while speaking on this subject let us here state

STACK GAS WATER HEATERS

With pleasure we announce that we have purchased the Canadian Patent Rights to manufacture and market Stack Circulating Tank Gas Water Heaters.

While the Stack Gas Water Heater is not generally known throughout Canada, this Heater has been in extensive use in the United States for over ten years. Gas Companies, Plumbing and Supply Houses, the Plumbing and Gas Appliance Trade are one in according the Stack Heater the highest reputation, and are pushing the sale of Stack Heaters hard, not alone from a monetary standpoint, but from one of actual merit. (See test below.)

We, ourselves, with a reputation of 25 years of satisfactory products to maintain, are prepared to guarantee this heater as follows:—

That it will produce more hot water for less gas fuel than any other Heater of similar capacity. That it is actually the most durable and long-lived Copper Coil Gas Water Heater made. That it is the easiest and quickest Heater to install. That in every customer secured for a Stack Water Heater, you have a customer who will be absolutely satisfied.

Will be on View for Demonstration in Stove Section
PROCESS BLDG., TORONTO EXHIBITION

Below is a Chart showing Comparative tests of Service of thirteen different standard makes of Gas Water Heaters. Style 2 Stack Heater is No. 4 on Chart. The Chart is made without fear or favor, and is absolutely bona-fide. It is significant.

The following makes of Heaters were Tested: Climax 30, Vulcan (412), Hoffman 20, Stack 2, Ruud 30, Clark Jewel 400, Eureka, Lion 1½, Rotary Est. 55, Clover Triumph 2, Acorn 2 (Tri-Coil), Garland 10, Simplex.

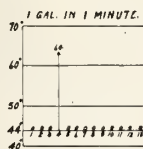
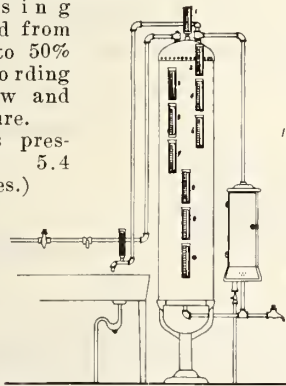
**Jas. Morrison Brass Mfg. Co.,
Ltd., 93-97 Adelaide St. W., Toronto**

Tests were made to show practical working points of the Heaters rather than technical. The heaters were tested under conditions conforming as nearly as possible with conditions as found in the general use of this type of heater. A thirty gallon range boiler was used with heaters connected in the usual manner. Gas was regulated to the maximum amount without showing too much loss through too high a flue temperature or too much loss through radiation.

A test was also made by running one gallon of water per minute through the heater while connected to the boiler.

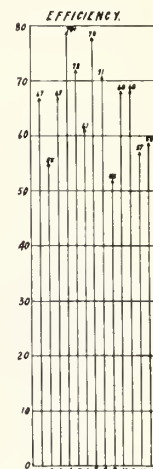
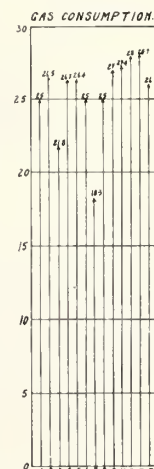
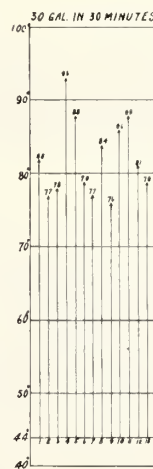
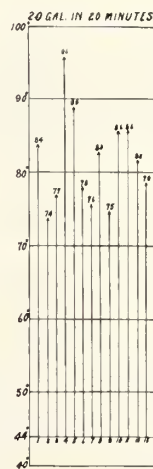
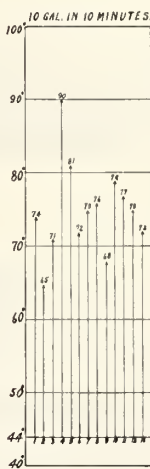
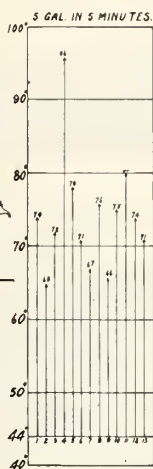
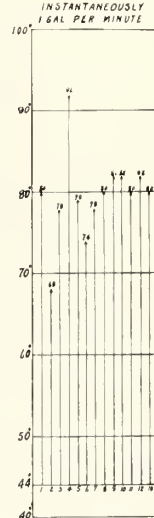
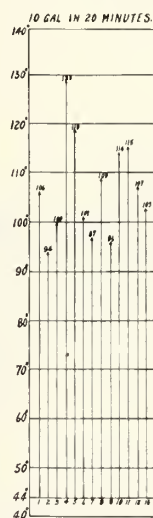
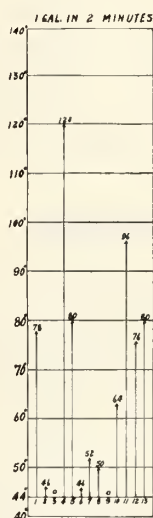
The loss caused by by-passing ranged from 15% to 50% according to flow and pressure.

Gas pressure 5.4 (inches.)



TESTS OF GAS WATER HEATERS

BY THE
ARLINGTON GAS LIGHT CO. ARLINGTON MASS



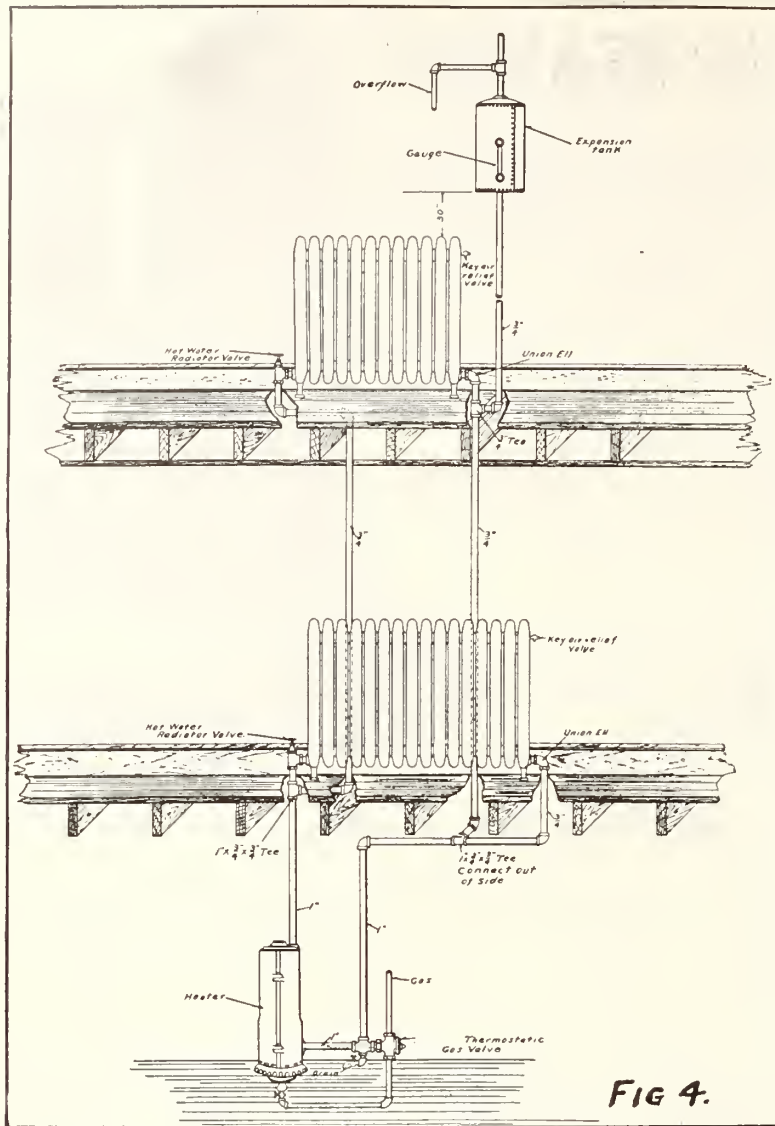


FIG 4.

also automatic, and if installed exactly as shown, is bound to give every satisfaction. The thermostatic valve closes off the gas by means of its own heat and requires little or no attention.

Grease Troubles Septic Tank.

The Editor Sanitary Engineer. — Re your answer published July 1st to the query "Grease troubles Septic tank," I herewith enclose sketch of tank as requested.

You will note that it is merely a concrete receptacle for the sewage, and the liquid is discharged through the overflow to the field drain.

It is in connection with a small country hotel, containing twenty bed-rooms with a lavatory basin in each, six toilets, four urinals, three baths, bar slop sink, kitchen and pantry sinks.

Any suggestions will be most acceptable.

H. J., B.C.

Again referring to our correspondent's trouble with grease, in septic tank, we are showing H. J.'s sketch.

This is as he says, "Merely a concrete receptacle," and not a septic tank. That is the reason why he is having trouble with grease.

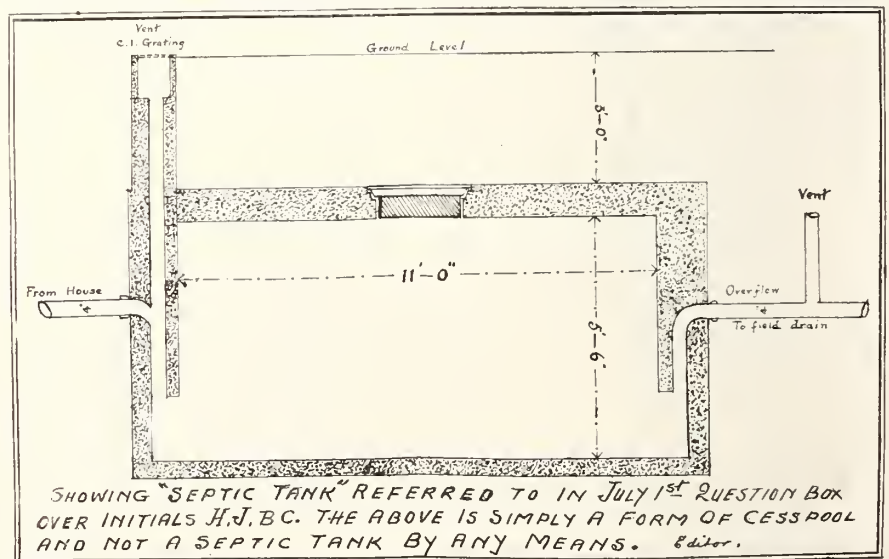
If it were a septic tank, the sewage (including grease) would set up micro-organism which would break up all solids

and grease, and dissolve them into such state that the bacteria in "Mother Earth," would attack them and "presto" the trouble would be ended. Well, now for a remedy. First of all we wish our readers to take another look at the sketch submitted by our correspondent. It will be seen that from the top of the ground, to the bottom of concrete tank is 8' 6." The overflow or outlet probably is approximately 2' 8" from bottom of tank, from the top of the ground down to the overflow would, therefore be approximately 5' 10" so that the irrigation tile will be that depth below the surface. Now in the first place even though the concrete tank were in actual fact a first rate septic tank, it could not be expected to work properly, because of the great depth of the tile pipes. However, in this case the trouble is with the construction of the tank in particular

If the tank had been of proper construction as shown on page 25 of this issue, means could have been devised to remedy the matter. On another page appears an article entitled "Septic tank installed below ordinary depth," and if our correspondent can reconstruct his tank, after the same manner, his grease troubles will no doubt be at an end. But if on the other hand this reconstruction cannot be made, we cannot help him out, except he install a system similar to one of several we have published from time to time in Sanitary Engineer.—Editor.

Passed Examinations.

The city of Moose Jaw passed a by-law on July 22, making it compulsory for plumbers to have a license. The following have been granted licenses:—W. C. Jones, Donald Campbell, Thomas Alexander, W. B. Hawke, A. F. Higgins, T. P. Baylis, A. A. Frost, W. J. Kennedy, W. F. Kampman, Senton Whitehead, Harry H. Taylor, and others.



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Fig. 106
Standard Pattern
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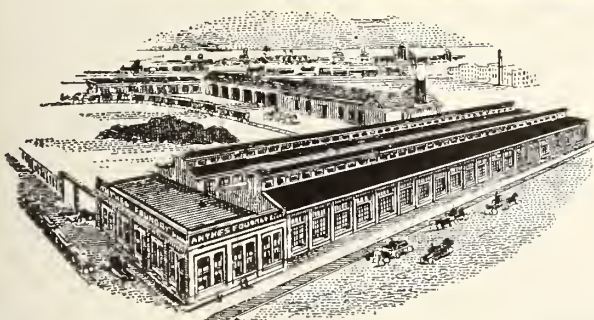
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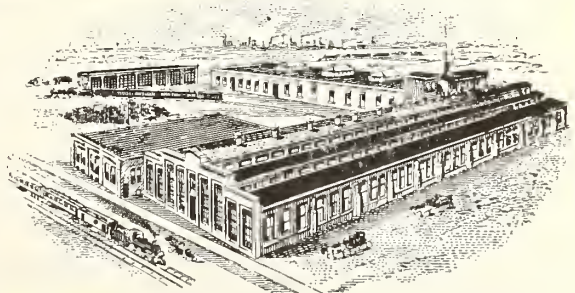
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C. A. Dunham & Co., Ltd., Toronto.
Mouat-Squires Co., Cleveland.
Honeywell Heating Specialty Co., Montreal.
National Steam Specialty Co., Chicago.
Kerr Engine Co., Walkerville, Ont.
The E. S. Manny Co., Montreal.
Dart Union Co., Ltd., Toronto.

Tools.

Canadian Tap & Die Co., Ltd.
Borden-Canadian Co., Toronto.
Nye Die, Tool & Machine Co., Chicago.
Hall & Sons, Ltd., Brantford.
Armstrong Mfg. Co., Bridgeport, U.S.A.
Williams, J. H., & Co., Brooklyn, N.Y.

Unions.

Dart Union Co., Ltd., Toronto.
Fittings, Limited, Oshawa.

Vitro Tanks.

Cluff Manufacturing Co., Ltd., Toronto.
James Robertson Co., Ltd., Toronto.
Cluff Bros., Ltd., Church St., Toronto.

Vacuum Systems of Heating.

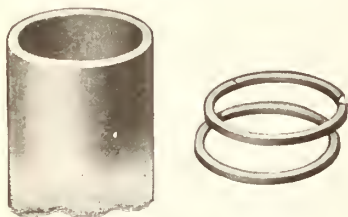
C. A. Dunham & Co., Ltd., Toronto.

Water Supply Systems.

National Equipment Co., Ltd., Wabash Avenue, Toronto.

Noburrs to ream
out or file off.

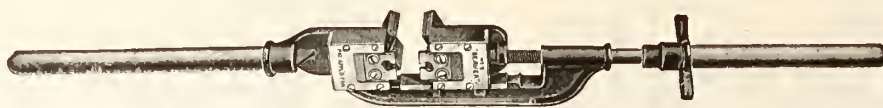
Pipe end always
clean and square.



Cut With "Beaver" Square-
End Pipe Cutter.



Done With Ordinary
Pipe Cutter.



The "Beaver" Square-End Pipe Cutter

will prove an investment that pays by dividends in the
form of a big saving of time, labor and worry.

It is not strained by feeding too fast, because you do not feed it—simply close it up on the pipe. The feed is automatic—simply pull two handles, same as a die stock. The form of the knives regulates the depth of the cut. These are the features which make the Beaver Knife Cutter a successful, practical tool. The largest users of Pipe have discarded wheel cutters in favor of "Beaver"

Square-End Pipe Cutters, as all will do who try them.

Works easier and quicker than a wheel cutter, and makes a square pipe end on which threading dies start easier, last longer and run straight. It cannot split pipe.

Let us put you in touch with users.

They'll convince you of its exceptional merits.

Write us now.

The Borden-Canadian Co., Toronto, Ont.

Mueller Rapidac

Fuller in Shape, Compression in Make

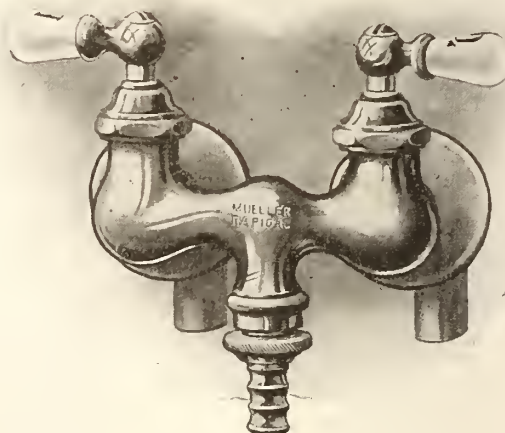
A quick-acting compression work, sturdy, staunch and dependable. It looks like Fuller work—operates just as easily—but built on the Compression principle, and just as strong and reliable as old-fashioned Compression.

Mueller Rapidac

Has won the confidence of the Plumbing trade everywhere and is being widely used, always with the utmost of satisfaction. It is thoroughly tested in our factory under 200 pounds pressure and is Unconditionally Guaranteed.

MADE IN SARNIA.

Mueller Rapidac Basin Cock.



9433

S.E.

H. MUELLER
MFG. CO., LTD.
Sarnia, Ont.

Send me Rapidac
Catalogue.

Signed

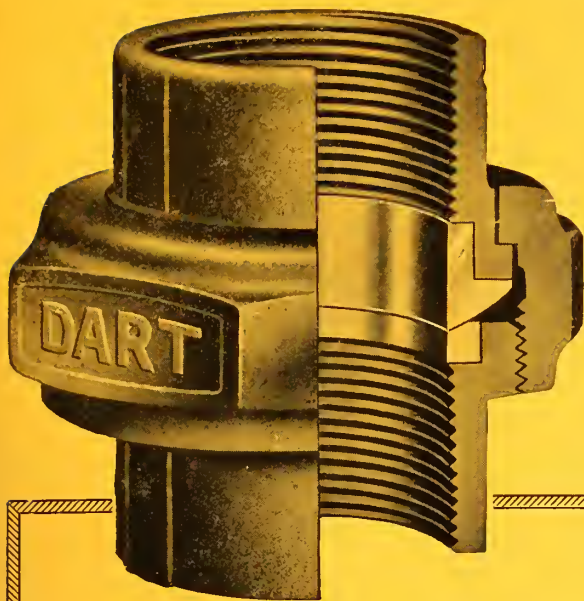
City Province

H. Mueller Mfg. Co., Ltd.

SARNIA, ONTARIO

MAKERS OF HIGH-GRADE PLUMBING GOODS.

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The "DART" Union Pipe Coupling

*will not rust or corrode at the joint
because both faces are of BRONZE*

The "Dart" Union is the kind to use for efficient pipe work. The ball-shaped seat allows a **quickly and easily made connection** whether pipes are in or out of line, so long as the nut can be started on the thread. **It never leaks**, unless deliberately loosened with a wrench. The heavy iron parts do not expand or contract—they insure durability and long service. **Your guarantee** (our trade-mark) is cast on every "Dart." You'll promptly get two new ones if a "Dart" is defective.

Buy them from your jobber.

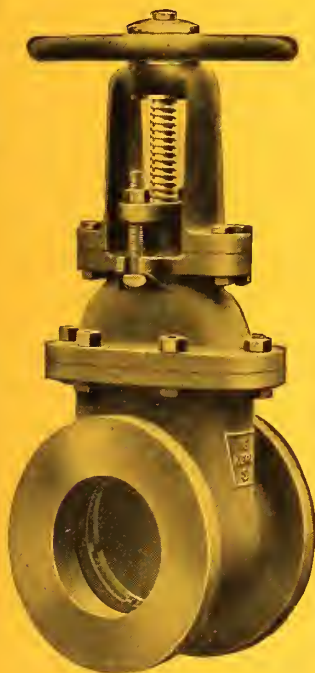
Dart Union Co., Ltd., Toronto, Ont.

KERR GATE VALVES

OUTSIDE SCREW AND YOKE

"KEYSTONE" PATTERN

Embody all the latest features



4½-in. and larger

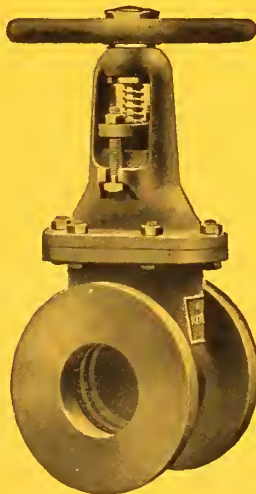
Screwed-in Seats

Deep Bronze
Bushed Gland
and Stuffing
Boxes.

Full Opening.

Large Diameter
Hand-Wheels.

Solid Wedge
Discs.



4-in. and smaller

Narrow face-to-
face Dimensions

Symmetrical
Design.

Good Material.

Interchangeable
Parts.

Guaranteed
Tested.



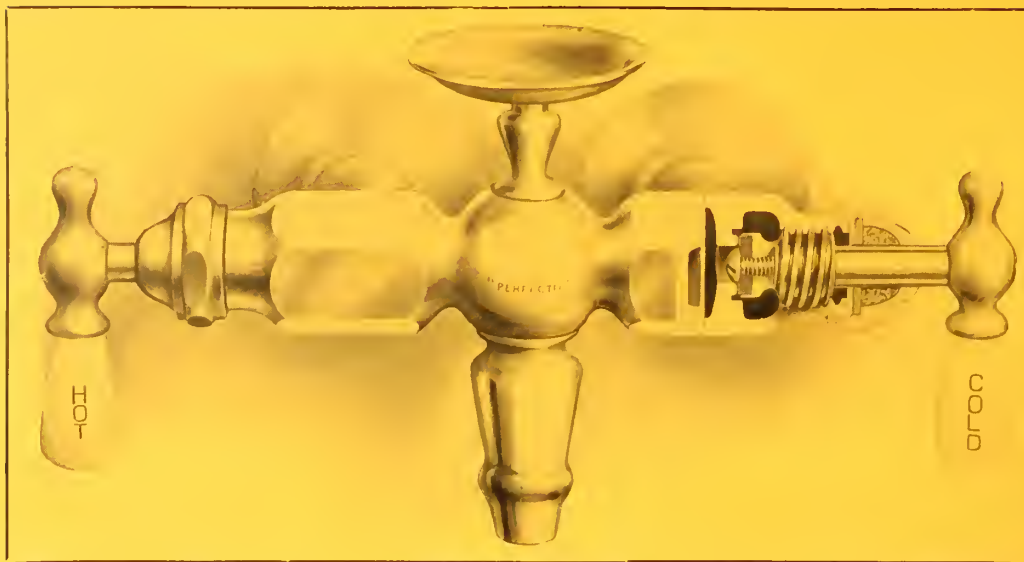
4½-in. and larger

Write at once for our new catalogue No. 5 and destroy all previous issues.

The Kerr Engine Co., Limited, MANUFACTURERS
Walkerville, Ontario

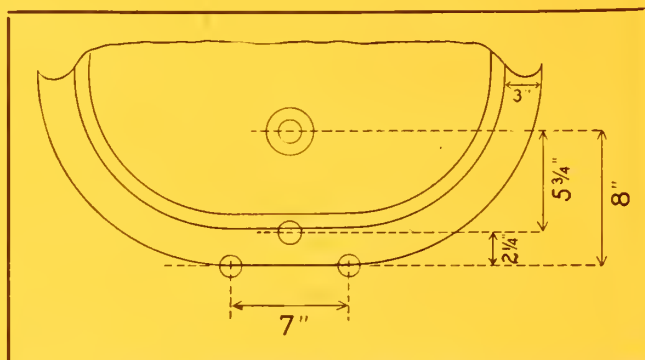
THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

GALT BRASS



"PERFECTO" (REG. 1913)

Use The "Perfecto" when in a hurry—
Saves half the time and all the worry.



"ROUGHING IN"



THE
"PERFECTO"

BATH COCK is a modern achievement in the quick-pressure or rapid-opening type, giving you lever action, and largest waterway made, coupled with a very attractive design.

COMBINATION WASTE AND OVERFLOW—Heavy cast parts, being adjustable, you have no tubes to cut, making it a great time saver.

SUPPLY PIPES are 3/8-inch iron pipe size and weight, seamless, annealed, offset, one piece of metal with expanded collar supporting conical rubber washer, and threaded at floor.

"ROUGHING IN" will, we trust, be of convenience to you. (All our other styles rough in the same as the "Perfecto.")

GUARANTEE—Same as we extend on all goods bearing our name.

SEND US YOUR ORDER NOW.

GALT, CANADA

BATH SET

THE SANITARY ENGINEER PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

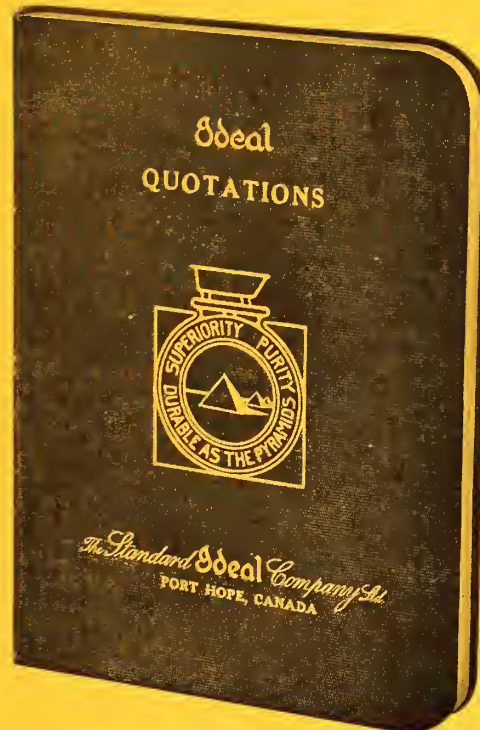
Publication Office : TORONTO, SEPT. 1, 1914

No. 17

Standard
Ideal

REVISED ILLUSTRATED PRICE BOOK

Contains illustrations, prices and descriptions of our entire line of Enameled Ware, including Brass Goods; in fact, all essential information for the purchase and sale of our products.



A copy was mailed August 29th, to every Architect, Jobber, Salesman and Plumber on our mailing lists in Ontario, Quebec and Maritime Provinces and to all Western Jobbers. If you didn't get your copy, please let us know.

Loose-leaf—actual size, 5x7"—fits the pocket.
CONTAINS CONSUMERS' PRICES.

This price book was compiled and published for the benefit and convenience of the Canadian Architects, Jobbers and Plumbers, and to promote the sale of our Sanitary Enameled Iron Ware.

MR. ARCHITECT: This price book will aid you in specifying Plumbing Fixtures, especially where you are limited to a definite price, because you can determine the cost, to your client, of any of our fixtures, and make your selection of the most desirable patterns within your limit, without delay or inconvenience.

MR. JOBBER: You are "betwixt and between" the Architect and Plumber. If our new price book helps them in their business, it cannot fail to be of assistance and benefit to you also.

MR. PLUMBER: This price book will enable you to quote your customer the RIGHT PRICE on any piece of our Ware "RIGHT OFF THE BAT." You don't need to "figure" or "guess" the price. Keep this book in your pocket or in some equally convenient place—the right prices are printed in it, and a fair profit has been provided for you.

Examine your copy of the price book carefully, and let us know if you don't think it is the most convenient and useful price book ever issued for and to the trade by any Enameled Ware Manufacturer, and, at the same time, make a mental note of the fact that our Enameled Iron Ware is the best on the market.

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

TORONTO
119 King St. East

MONTREAL
42-44 Beaver Hall Hill

WINNIPEG
76-82 Lombard St.

VANCOUVER
410 Carter Cotton Bldg.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

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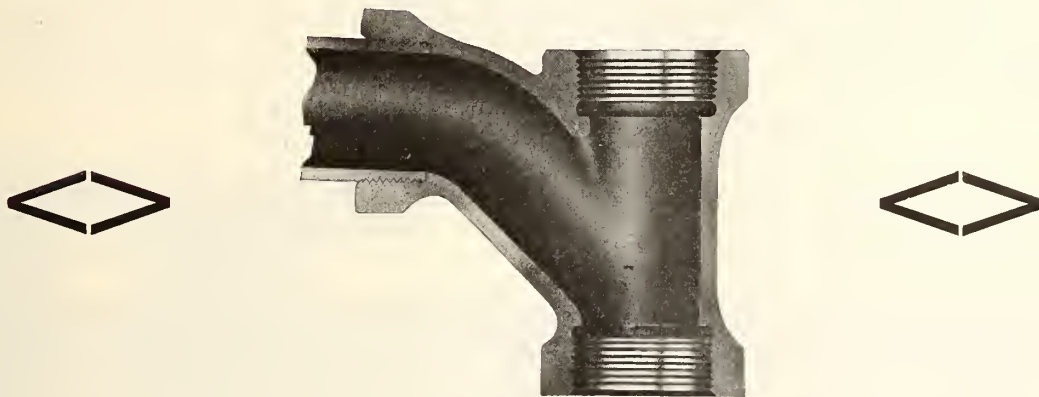
ONTARIO:
Monarch Brass Mfg. Co.,
178 Victoria St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes,
120 Lombard St., Winnipeg

BRITISH COLUMBIA:
A. O. Campbell,
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RECESSED DRAINAGE FITTINGS

**We are now Manufacturing
a complete line**



FITTINGS LIMITED OSHAWA

MONTREAL

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OSBORNE HOUSE, ISLE OF WIGHT
FORMER RESIDENCE OF THE LATE QUEEN VICTORIA OF ENGLAND



ROYAL PALACE OF LA MAGDALENA
SUMMER RESIDENCE OF THE KING AND QUEEN OF SPAIN



SANDRINGHAM HOUSE
COUNTRY RESIDENCE OF THE KING AND QUEEN OF ENGLAND

Royal Palaces in which "Standard Sanitary" Plumbing Fixtures were installed—a few notable examples of their world-wide popularity

"Standard Sanitary" Plumbing Fixtures can be obtained anywhere in the Dominion. They are handled by leading Plumbers throughout the provinces and are carried in stock by Jobbers and Sales Agents throughout the Dominion of Canada, thus facilitating prompt deliveries.

Standard Sanitary Mfg. Co.

Limited

General Offices and Factory: Royce and Lansdowne Aves., Toronto, Ontario

TORONTO STORE

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HAMILTON STORE

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BALMORAL CASTLE
SCOTTISH RESIDENCE OF THE KING AND QUEEN OF ENGLAND



THE QUIRINAL
OFFICIAL RESIDENCE OF THE KING AND QUEEN OF ITALY, ROME



BUCKINGHAM PALACE
OFFICIAL RESIDENCE OF THE KING AND QUEEN OF ENGLAND, LONDON



PALACE OF THE KING OF THE BELGIANS
BRUSSELS



THE DAISY BOILER

**Over 55,000
DAISY
Boilers**

are giving the best of service throughout Canada.

The Daisy has qualities which make it a better proposition than any other on the market.



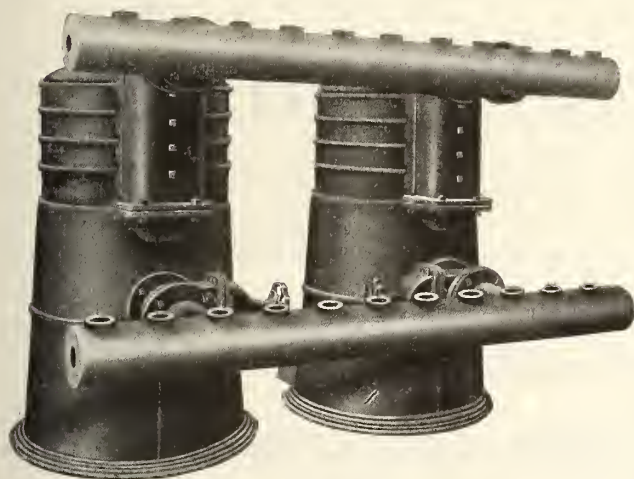
Made in the best equipped plant in Canada.

Without doubt the most popular boiler made.

Every installation means another customer satisfied.

Minimum consumption of fuel.

Maximum amount of heat.



Rear view of two Daisy Boilers connected with twin headers. This system gives great satisfaction in mild and extreme weather.

WARDEN KING LIMITED, MONTREAL

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AGENTS:

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The JAMES ROBERTSON CO., Limited, ST. JOHN, N.B.
The WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

Quality all the way through

SYDENHAM

Plumbers' Brass Goods

Ask your jobber about them



No. 614

Manufactured by

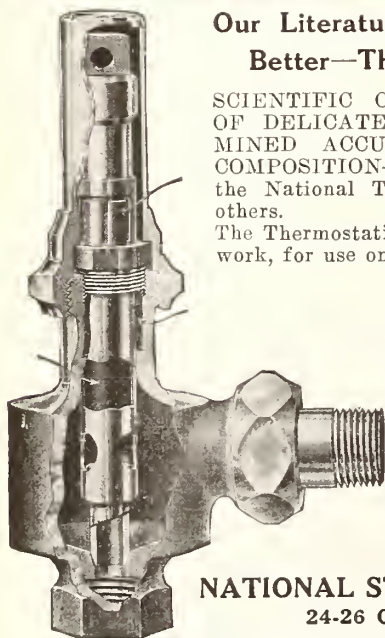
THE WALLACEBURG BRASS & IRON MANUFACTURING CO., LIMITED
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L. N. Vanstone,
8-10 Wellington St. E.

Winnipeg,
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Scott Bldg.

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142 St. Joseph Boulevard West

National Valves.
Scientifically } Correct
Economically }
Usefully }



Our Literature Tells Why They're
Better—Their Use Proves It.

SCIENTIFIC CONSTRUCTION—ABSENCE OF DELICATE PARTS — PRE-DETERMINED ACCURACY — BRASS-ENCASED COMPOSITION—all of these are features of the National Thermostatic Trap—there are others.

The Thermostatic Valve is adapted to various work, for use on Vacuum Systems, Dry Kilns, etc., etc., and is guaranteed for 5 years.

If you want Perfect Service, based on perfect valve principles, the National Thermostatic Valve will answer this purpose.

Write for our literature on the complete National Line, such as the B Heat Intensifier, B Pipe Joint Compound, "Perfection" Radiator Fitting, etc., etc.

NATIONAL STEAM SPECIALTY CO.
24-26 Clinton St., Chicago

Surples, Dunn & Co., 74 Murray St., New York
L. N. Vanstone, 8 Wellington St. East, Toronto
Moncrieff & Endress, Limited, Scott Bldg., Winnipeg

300,000 lbs.

carried in stock for immediate
shipment of

Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

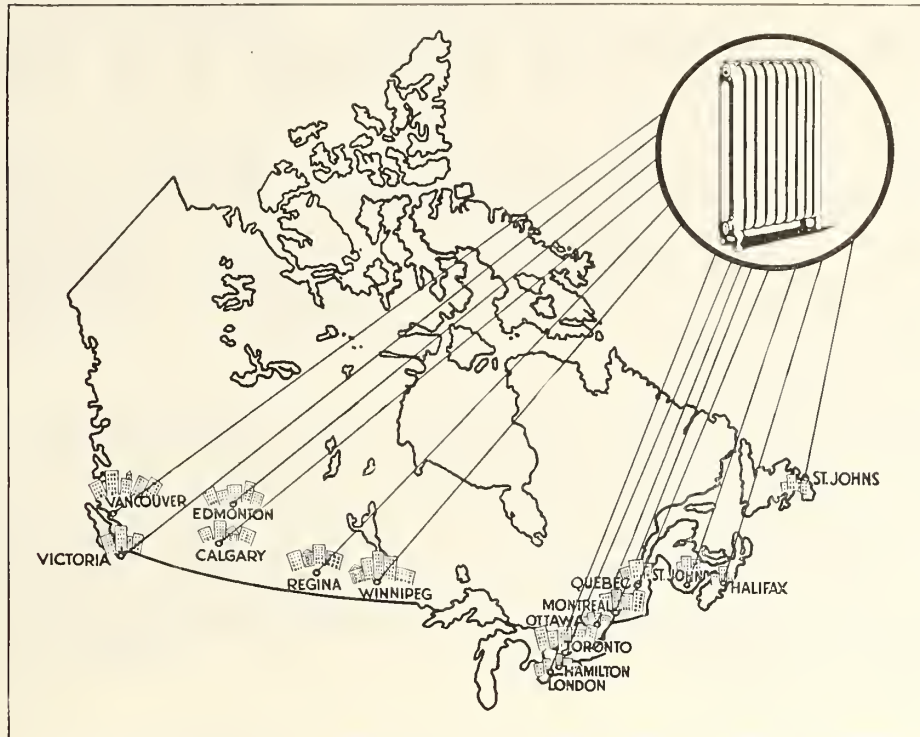
Brass and Copper Rod.

Brass and Copper Sheet.

WRITE US FOR PRICES

Tallman Brass & Metal Co.
HAMILTON, ONT.

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Gurney Supply Depots

EVERY Plumber and Steamfitter in Canada is close to the source of supply for Gurney Oxford Products.

Canada is a wide country and freight trains do not travel quickly. So in order to enable our customers to get Gurney Oxford Products "in a hurry" we established a chain of supply depots across the country.

There is a resident agent at each point shown in above map and a warehouse at nearly every point.

This is more than simply a matter of convenience.

It is often a matter of dollars and cents to be able to get your supplies without delay.

Because of their design, efficiency and uniformly high quality, Gurney Oxford Products are used in the length and breadth of Canada. They are *in demand*, as every Plumber and Steamfitter knows, and the organization for prompt deliveries which we maintain is for the purpose of supplying those Gurney Oxford Products which are *in demand in a hurry*.



The Gurney Foundry Co., Ltd.

Established 1843

TORONTO,

And Everywhere in CANADA



G.M.C. WATER SYSTEMS

at

The Canadian National Exhibition.

We invite you all to visit us in Machinery Hall, where we will show—

Complete Water Systems in operation

The new G.M.C. Deep Well Pump

The new G.M.C. "Victor" Electric Water Lifter

The new G.M.C. Ball-Bearing Pump

and other interesting and instructive pumping apparatus.

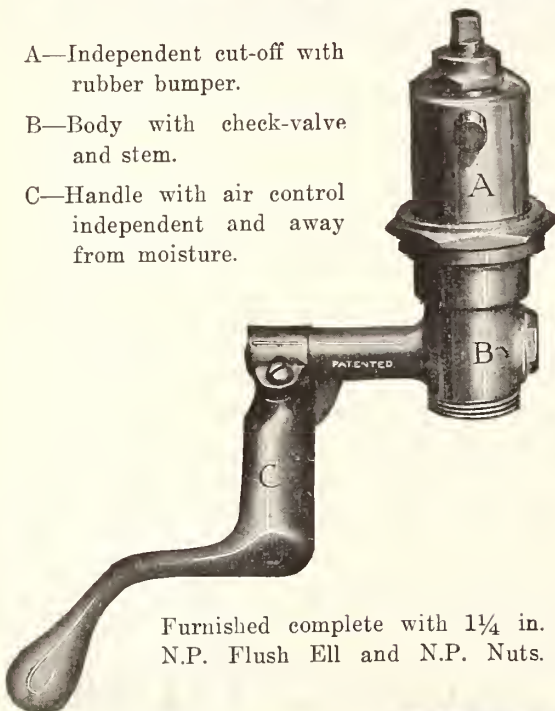
The General Machinery Co. Ltd., 22-26 Mulock Ave., Toronto



Wolverine Flush Valve

PATENTED

- A—Independent cut-off with rubber bumper.
- B—Body with check-valve and stem.
- C—Handle with air control independent and away from moisture.



Furnished complete with 1¼ in.
N.P. Flush Ell and N.P. Nuts.

Durable - Inexpensive - Economical - Simple

The only Direct valve on the market. No small by-passes to stop up or corrode and each valve is furnished with independent cut-off with rubber seat bumper.

Flush can be adjusted without shutting off the water.

For Direct pressure or gravity systems. Write us for price and further information.

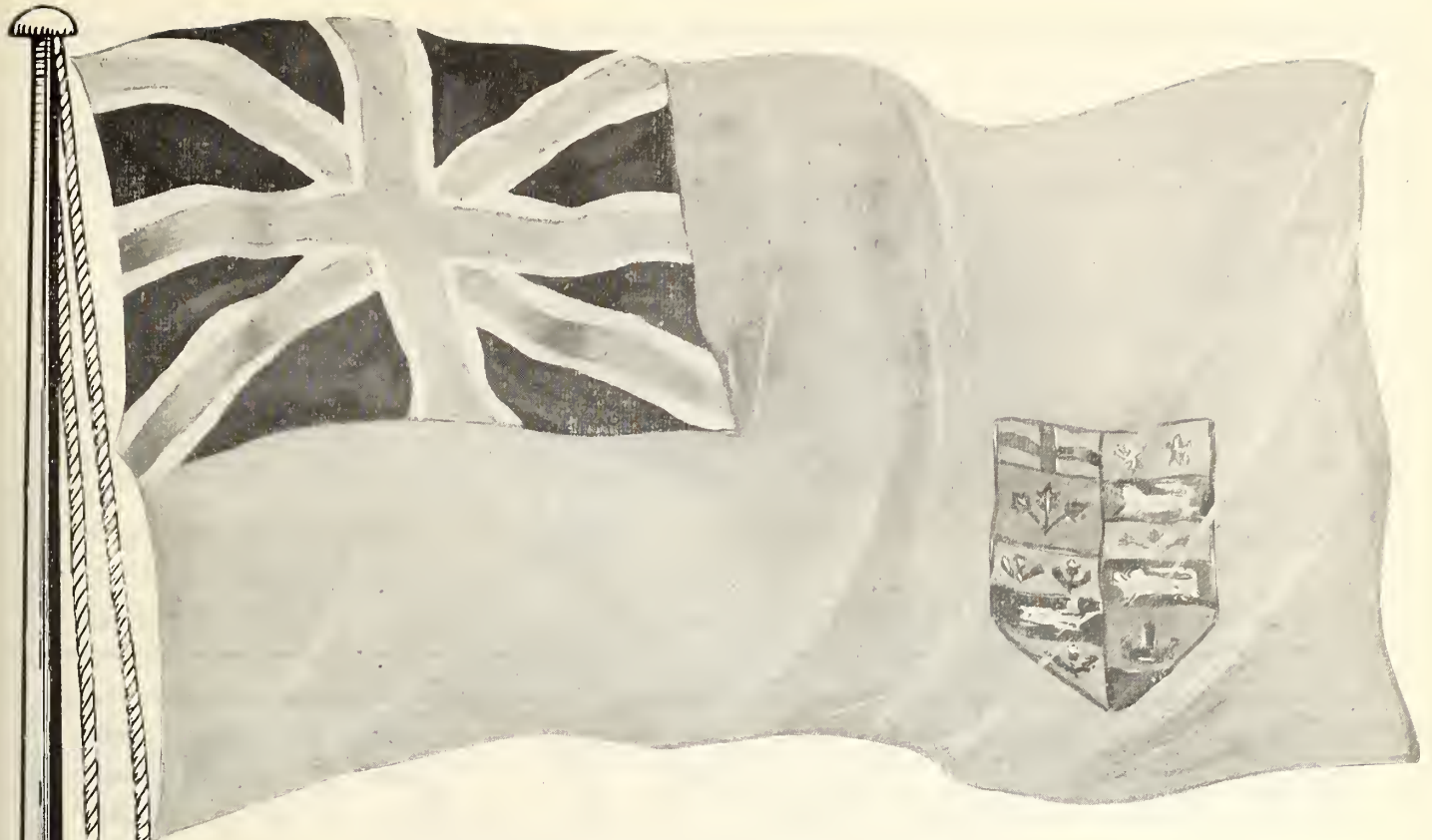
Manufactured and guaranteed by

Canadian Wolverine Co.
LIMITED

Chatham, Ont.



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CONFIDENCE

A CRISIS unique in the history of the world threatens the Flag that through the centuries has been carried by glorious heroes through blood and fire, that we who live beneath its folds might enjoy a degree of freedom of both thought and action, together with a sense of security, never known under any other.

What shall history say of the panicky pessimists who, at the first suggestion of disaster, suddenly close up their factories and throw upon their own resources their employees and the women and children depending upon them for their daily bread?

This Company believes that its duty lies in continuing operations at full capacity, and this we will continue to do to the extreme limit of our resources.

We are building four times more Peerless Water Systems than the present market will absorb, but our faith is strong that the true spirit of a bold and virile Canadianism, together with the great heritage of British pluck and the strong recuperative power of British institutions, will ultimately justify our policy.

You can help by buying Canadian goods.

NATIONAL EQUIPMENT COMPANY, Limited
TORONTO

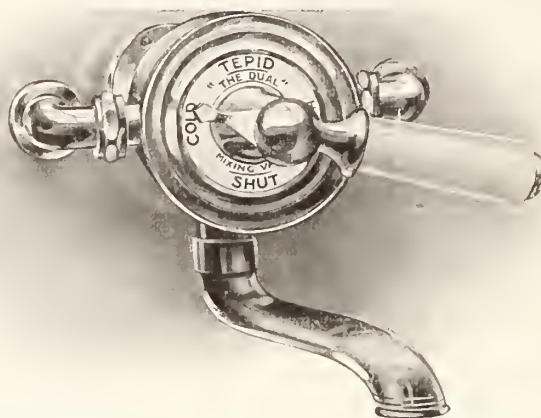
The
Finest Industrial
Bath Installation in
EUROPE

is at

Messrs. Brunner
Mond Co.,
Northwich, Eng.

where 2000 employ-
ees are provided for
by these mixers.

"THE DUAL" Compression Mixing Valve



Strong and well built,
made to stand hard usage.

It can be taken to pieces
without disturbing connec-
tions.

Made in various types for
baths, lavatories, showers,
etc., also special stock pat-
tern with one or two out-
lets at option for making
up sets.

Send for descriptive booklet

Made by GUMMERS LIMITED—Effingham Brass Works—ROTHERHAM, ENGLAND.

Canadian Agent:—GEO. CARPENTER, 314 University Street - MONTREAL

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for

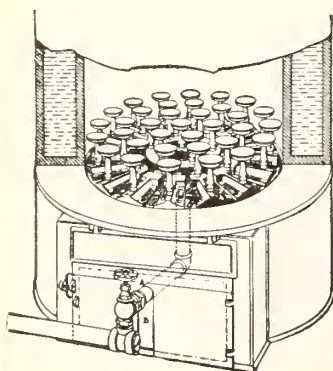


Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal

Works: Lachine Canal



"Standard" Gas Saving Burners

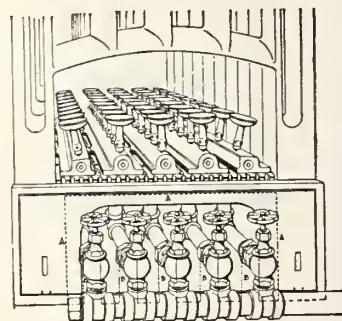
Every Plumber or Gas Fitter is interested in applying the **Right Burner** to the heater used for warming—that is, the Steam or Hot Water or Hot Air Furnace whether it be in the house, the church, store, school building, or other buildings.

The "Standard" Gas Saving Burner is the right Burner for this service. "Standard" Burners produce the largest amount of heat for consumption of gas. Instructions for installing furnished with each burner.

Standard Heating & Radiator Co.

Manufacturers

Write for Catalogue Pittsburgh, Pa., U.S.A.



TWO CENTS PER WORD

You can talk across the continent for two cents per word with a WANT AD. in this paper

GAS Companies and the Public demand a Strong, Durable Gas Mantle with a high candle power, and at popular prices. The Trade can now absolutely rely upon being able to supply such a mantle in the "LADDITE"

**GOLD MEDAL
awarded**

Franco-British Exhibition, 1908.

Light maintained
in all its brilliancy
2,000 hours

Surpassing all
for

Street Lighting

Railways or
Docks

Factory or
Office

Mansion or
Cottage

Church or
Institution

For All Purposes

as it is the

Strongest and
Most Durable

THE STAR OF THE MANTLE WORLD



The **STRONGEST MANTLE MADE**
— It **HARDENS** and **INCREASES**
in Candle Power as it burns, and is
the only one that **MAINTAINS** its
BRILLIANCY for over **2,000 Working**
Hours. Made in England.

[COPYRIGHT]

IN ADDITION TO OUR MAKE OF EVERY DESCRIPTION OF MANTLE FOR NATURAL AND ARTIFICIAL GAS — WE ALSO MANUFACTURE MANTLES FOR OIL AND GASOLINE, BOTH NORMAL AND HIGH PRESSURES, AND FOR ACETYLENE GAS. EITHER OF THE ABOVE MENTIONED ARE MADE IN SOFT OR FINISHED STYLE.

THE STRONGEST MANTLE MADE

Compare it with others. Millions of "LADDITE" Mantles now in use in Great Britain and abroad

NOTE.—See our Mantle-Making Machine in operation in Process Building, Canadian National Exhibition, Toronto, August 29th to September 12th

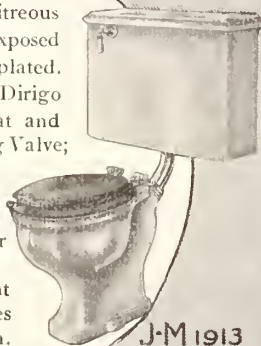
The Hamilton Gas Mantle Company, Limited

18-24 Ferguson Avenue North, Hamilton, Ontario

JOHNS-MANVILLE Plumbing Products Hold the Good-Will of Your Customers

Their advance features of construction and the quality-policy behind them, insure the greatest comfort, convenience, sanitation and satisfaction.

Tank and bowl of fine vitreous china. All exposed parts heavily nickel-plated. Equipped with J-M Dirigo Solderless Copper Float and Douglas Pattern Flushing Valve; fitted with the famous J-M Sanitor One-Piece Seat. Water Surface 75 sq. ins., with 3-in. water seal. Instantaneous and practically silent in action, gives perfect flush.



J-M 1913
Vitreous
China Combination

Leakage absolutely impossible with this faucet. Made with conical valve over spherical seating. Metal-to-metal line contact perfect at all times. Seating guaranteed for ten years. Never needs washers nor repairs. For high or low pressure; hot or cold lines. Thousands in use for years in London and other large cities.



J-M
Washerless
Faucet

Contains only two working parts—a stem and a plunger. Simplest and most efficient flushing device made. Attractive appearance. Can be installed in any position. For use in connection with flushing closets, urinals, slop sinks, etc. **Guaranteed** to control the flow of water and to give proper flush and refill when sufficient water is supplied at 10 lbs. pressure or more maintained at the valve.



J-M
Valve

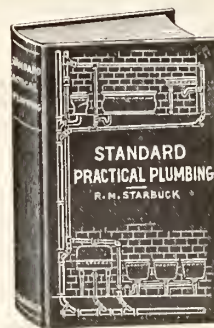
Write our nearest Branch for Booklets.

THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED

Manufacturers of Plumbing Fixtures; Closet Seats; Copper Floats; Pipe Coverings; Pipe Joint Cement; Joint Runners; Packings, etc.



TORONTO
MONTREAL
WINNIPEG
2632 VANCOUVER



A WANTABLE BOOK

Standard Practical Plumbing

By R. M. Starbuck

347 SPECIALLY MADE ILLUSTRATIONS

PRICE \$3.00

"Standard Practical Plumbing" is indispensable to the Master Plumber, the Journeyman Plumber, and the Apprentice Plumber. As the book is specially strong in the exhaustive treatment of the skilled work of the plumber, it commends itself at once to every one working in any branch of the plumbing trade. Send for it to-day.

TECHNICAL BOOK DEPARTMENT

MACLEAN PUBLISHING COMPANY

143-153 UNIVERSITY AVENUE - TORONTO

Advertising

Advertising is the education of the public as to who you are, where you are, and what you have to offer in the way of skill, talent or commodity. The only man who should not advertise is the man who has nothing to offer the world in the way of commodity or service." — Elbert Hubbard.

Where Accuracy Counts

In your Filing, where "accuracy" is the watchword,
you can rely on

NICHOLSON-MADE-FILES

Their use speeds up production, and increases accuracy as well. They cut unusually deep—have exceedingly long service-life—and are uniform in "feel" and "draw." Workmen lose no time—waste no material—in "getting the hang" of these files. With an output of 50,000,000 yearly, we control absolutely every step in the making of our files. From raw steel to finished file, we supervise every process. When a NICHOLSON-MADE-FILE passes our system of rigid inspections and practical tests, it is by far the most efficient and economical type of file that can be made for its purpose. As a time-saving, money-making, accuracy-assuring proposition, NICHOLSON-MADE-FILES should be used in your work.

**50
YEARS
IN THE
BUSINESS**

**OVER
50,000,000
FILES
AYEAR**

BRANDS:

**Kearney & Foot Great Western
American Arcade Globe**

NICHOLSON FILE CO. - Port Hope

"FILE PHILOSOPHY"—A 50 years' education on Files
in an hour, and our Catalog, sent FREE on request.



**Our
"Little Gem"
Automatic Air Valve**

is equal to any radiator valve on the market and is sold at a very reasonable price.

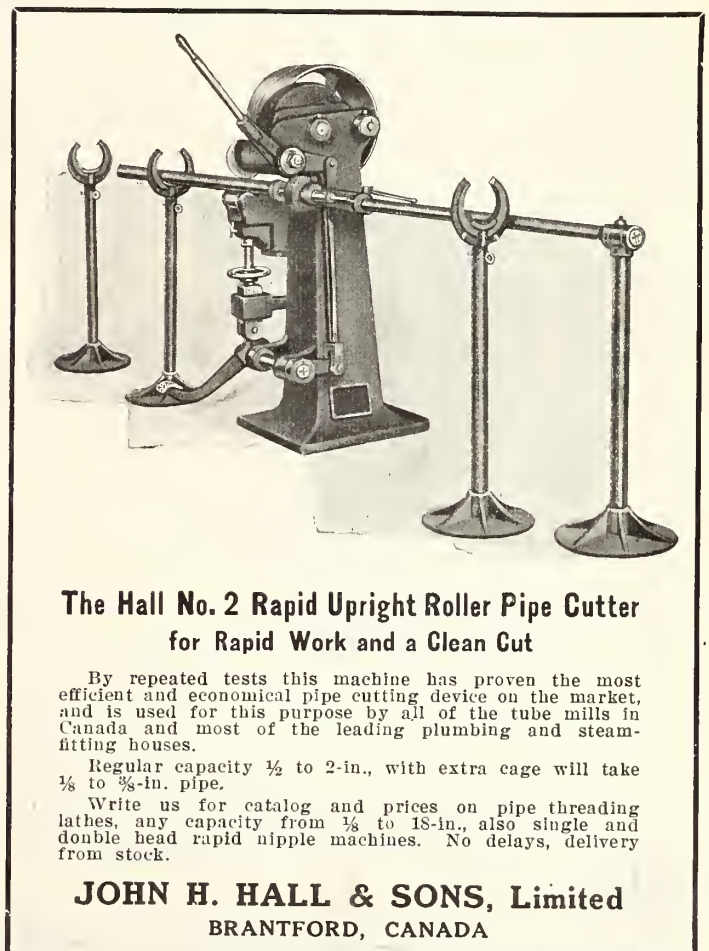
Our Radiator Foot Rail

can be attached in a very few minutes to any standard radiator without special hooks or expert advice.

WE ALSO MAKE THE LINES SHOWN ON CUT.

**The BEATON & CADWELL
MANUFACTURING CO.**
New Britain, Conn.

Eastern Agent: J. R. Devereux, 142 St. Joseph Boulevard West, Montreal.
Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.



**The Hall No. 2 Rapid Upright Roller Pipe Cutter
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PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, SEPTEMBER 1, 1914

No. 17

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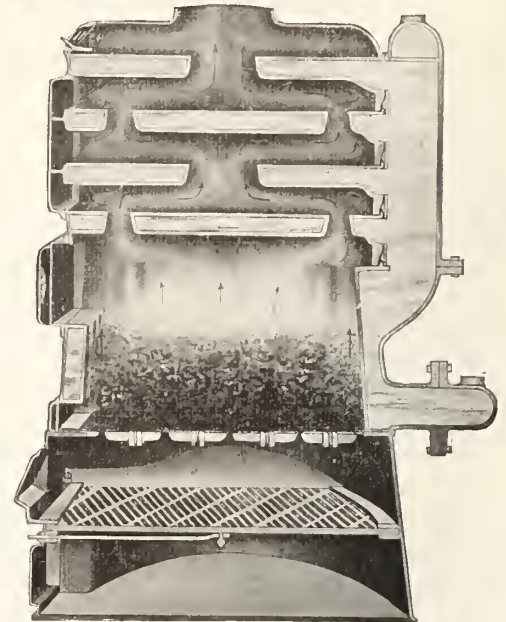
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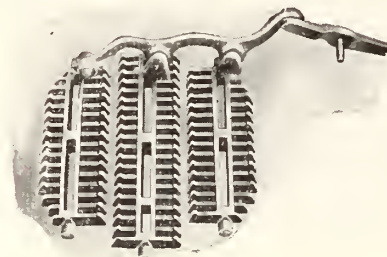
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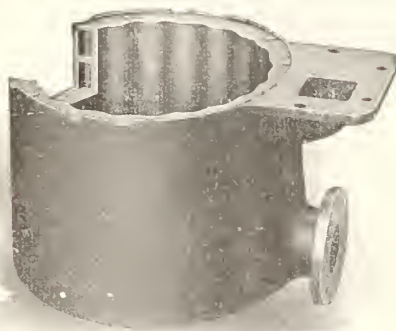
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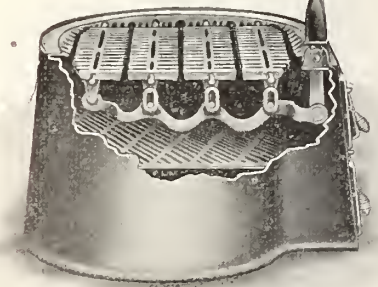


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THE SANITARY ENGINEER

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Leaking Fixtures Create Economic Warfare

Showing That by Repairing Leaks the Whole Craft Could be Profitably Employed Throughout the War, and at the Same Time Eliminate Waste of Water, Which Would More Than Cover Cost of Repairs.

NEVER was there a time in the history of the world when labor was at such a discount as it is to-day. Time, too, is not as important a commodity to the industrial world. Simply because demands are falling off for various lines, building progress has been checked for lack of money and the wage-earner seems to be in a fair way to be "hard hit." Such seems to be the case just at present to a great extent in the sanitary, heating and ventilating trade. Now why should this be? If every property owner who is drawing rent would look about and see what state his plumbing fixtures are in, if the city authorities were to require that all insanitary fixtures be replaced or put into good order and therefore sanitary; if all leaking fixtures were ordered to be repaired or replaced, there would be enough work, assuming such a step could be taken, for every journeyman in Canada. Manufacturers of all such goods could run their factories the best part of the time.

Owners of property never had such an opportunity to assist the wheels of our Canadian factories to keep running as they have at present, and we do not know of a single industry where labor plays so important a part as that of the sanitary, heating and ventilating profession. The most expensive machinery is required, the most skilled mechanics are employed, and for a single industry it requires the most capital of any other industry in Canada. All this capital which is involved in our profession, is of a progressive nature. It is necessary that sanitation be carried on progressively. Sanitation has preserved more lives than all the wars that have ever been planned have ever destroyed or will kill. Sanitation builds up a robust nation. It builds up a sane nation and work that is accomplished during times of war will bring compound interest to the country. Every waste should be eliminated. "Wasteful waste makes woeful want." Pure water and air is the most essential of all other matter and we should not pol-

lute it, neither waste it. If the city of Toronto, for instance, were to see to it that all waste of water was stopped, every man could be kept working. If the city of Toronto were to install meters in every house their waterworks plant would be big enough to supply all the water for a population of over 1½ million persons, and the sewage disposal plant would give better satisfaction.

Every city in Canada is spending too much money and investing too little. There is a great difference between the two. If a city cannot install or organize a garbage system which will pay its own expenses (in a sanitary manner) it does not know how to invest. If a sewage disposal plant cannot pay all expense of its running, it too is an economic waste, and if ever there was a time when money should be invested (therefore conserved), it is at such a period as we in Canada are now passing through.

To prove the necessity that all waste of water should be stopped from a purely economic standpoint, we are going to refer to no less than five articles which appeared in the pages of The Sanitary Engineer during the months of August, September and October of last year. In the issue of Aug. 15, 1913, an article appeared entitled, "The Cost of Steady Leaks in Fixtures," and in part reads as follows:—

The property owner pays for water waste in two ways. He pays for additions to the plant, such as new water sheds, reservoirs, tunnels, and pumping stations, rendered necessary by the waste, and he pays for the higher operating expenses caused by the increased consumption.

In New York City, for example, thanks to its prodigal water waste, taxpayers must pay \$260,000,000 for a new system of supply, and \$10,000,000 more for a tunnel to carry it from the reservoirs. When the time comes for the distribution of the new supply, new pipes must be laid in the city streets, for the old pipes will be unable to withstand the pressure. Likewise, new pipes

must be laid in the buildings. And the taxpayer will see the cost of the new city mains reflected in his tax bill and will give the plumber more money for putting new pipes in his building.

If New York's water supply had been properly conserved, storage reservoirs, built at a cost of \$50,000,000 or \$60,000,000, would have furnished a sufficient supply, even though two years passed without a rainfall.

People let their faucets drip, let their pipes leak, and give no heed. They think water is as plentiful as air. They do not know that a drip 1-32 of an inch in diameter, estimated on the meter value of water at \$1 per thousand cubic feet, represents in a year the loss of \$11.68. In metered property in New York where owners have called in the services of experts to locate leakage, they have saved from one-sixth to two-thirds of their annual water bills. Hotels, restaurants and apartment houses are especially liable to this waste. The average owner or lessee seldom has the knowledge to enable him to ascertain the one or more causes that produce water waste.

In Canada we are laboring under similar difficulties. Most cities adopt the flat rate charges for water and we are having to pay huge sums for larger water-works and water supply systems. What is going to be done? Who is it that should show up this terrible evil of water wasting? It is the sanitary engineer. He is directly and indirectly interested. He is to a certain extent responsible. He is the one who can point out the evils in the best light. It is up to him every time. Now in these times when the trade is not busy, there is this department of repairing leaks. The sanitary engineer could show his customer that he is paying for these leaks, and paying double the amount in his taxes, that it would cost in keeping his plumbing fixtures in good order, especially if done at the right time.

In Sept. 15, 1913, issue a few comparative notes referred to the cost of "leaks" and read as follows:—

HOW MUCH OF THIS IS DEMANDED TO SUPPLY THE "LEAKS?"

Montreal heads the list for consumption of water. She needs 70,000,000 gallons per day.

Toronto comes next and takes about 45,000,000 gallons per day.

Other Canadian cities take about the same per capita, which is on an average of 113 gallons per day for every person in the cities where they have water-works.

We venture to state that at least 40 per cent. of this can be accounted for by leaks.

The total cost of maintenance per annum is about \$3,435,000, and to be very conservative \$1,000,000 of that could be saved by "fixing the leaks."

In the issue of Oct 1, 1913, a very interesting article appeared, which read in part as follows:—

The subject of a metered water supply is one of great interest, not only in connection with economy of distribution but also in regard to the fairness of the method of taxation as compared with the flat rate assessment. The waste of water is also greatly reduced by the metered system with resultant economy to the taxpayer.

There is a metered service in operation in Milwaukee, and the figures accompanying this article were compiled by the city engineer of that place. The average daily consumption of water in Milwaukee in 1912 was 47,556,000 gals., or 113 gals. per capita per day, but eliminating the 100 largest consumers, it was only 75 gals. as compared with nearly 200 in Ottawa. The actual cost per thousand gals., including sinking fund charges, depreciation, taxes, and 4 per cent. interest on net invested capital was 5.733c; the revenue based on total pumpage was 4.676c per 1,000 gals., and based on the total for which the city actually received payment, 6.257c per 1,000 gals.

Classification of Water Consumers, Milwaukee, Wis.

1,185	pay less than \$0.50 per year	2.10%
6,347	pay between \$0.50 and \$1.00 per year	11.00%
15,182	pay between \$1.00 and \$2.00 per year	26.33%
10,656	pay between \$2.00 and \$3.00 per year	18.48%
7,157	pay between \$3.00 and \$4.00 per year	12.41%
4,899	pay between \$4.00 and \$5.00 per year	8.5034
8,017	pay between \$5.00 and \$10 per year	3.86%
598	pay between \$20.00 and \$30 per year	1.00%
271	pay between \$30.00 and \$40 per year	0.47%
167	pay between \$40.00 and	

\$50 per year	0.29%
376 pay between \$50.00 and \$100 per year	0.65%
428 pay between \$100 and \$500 per year	0.76%
66 pay between \$500 and \$1,000 per year	0.11%
80 pay between \$1,000 and over	0.14%
57,657	100.00%

The advantages of a metered supply should be obvious. Wilful waste is done away with and the charges for water can be equitably adjusted. In the case of Milwaukee one hundred of the largest consumers paid \$402,563, or nearly 50 per cent. of the entire revenue of the water department during 1912. Of the water consumers of Milwaukee, 58 per cent. paid less than \$3.00 per year and 70 per cent.—over two-thirds—paid less than \$4.00. Can any eastern Canadian city make anything like as good a showing?

During 1911 and 1912, on account of a threatened shortage in the supply, a vigorous campaign to prevent water waste was carried on in New York city. The methods generally employed were as follows:—

(1) The attention of consumers was called to the necessity for checking waste.

(2) A house to house inspection was carried on in order to detect and repair leaks.

(3) An examination was carried on with the object of locating and repairing underground leaks.

(4) Connections were metered where the cost of metering and the existing conditions of the supply warranted this measure.

The results obtained were noteworthy in many respects. The estimated daily reduction in consumption in Manhattan and the Bronx reached a maximum of 71 million gallons in August, 1911; averaged 65 million gallons for the last six months of 1911, and almost 50 million gallons for the year 1912. The aggregate value of the water thus saved, if figured at meter rates, \$133 per million gallons, would be nearly \$6,500,000,

while the total cost of the work was only \$167,000.

These figures are also interesting in so much as they prove that no unnecessary water works expenditure is made on account of waste water.

There are cities in Canada to-day which if the meter system was to come into force their water works would be found to be large enough for years to come.

And again on Oct. 15 reference was made to the terrific waste of water and compared the cost, showing how money could be saved by "fixing the leaks." This article is herewith reprinted in part and should be read by every member of the craft:—

That Montreal's new \$3,000,000 filtration plant, regarding which there has been so much discussion this summer, is not large enough, and that within twelve months at the latest another \$1,000,000 or more will have to be spent on the work in order that it may meet the requirements of the city, is a situation which officials of the city aqueduct department recently disclosed at the City Hall.

That the matter is a serious one, and one which will have to be taken up without loss of time, is evident from the statement made public regarding the city's consumption of water, and the steps that are about to be taken to increase the pumping capacity.

Sanitary engineers voice to their customers in no small way the very good reason that all leaks should be attended to. Montreal citizens are not the only people who are having to spend large sums on further extensions to their water works. Almost every city in Canada is laboring under the same terrific load of expense.

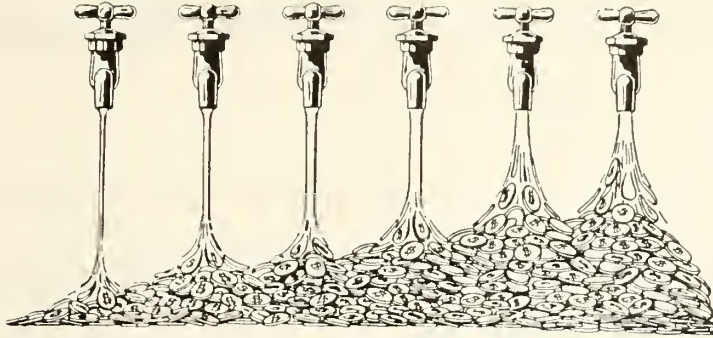
When we consider the amount of water a 64th of one inch will leak in 24 hours, the cost is enormous, and should be attended to.

The w.c. tank is the worst source of leaks in our homes, and such a small leak as one-sixty-fourth on an inch could scarcely be noticed, and at the average rate charge for water it would cost a matter of \$3.65 a year.

This is not the only cost. If when a

UNDER AVERAGE WATER RATES AND PRESSURES THIS IS THE WAY THAT LEAKS RUN INTO MONEY

Each 1-64 inch leak wastes	2 gallons per hour and costs	1c per day
Each 1-32 inch leak wastes	8 gallons per hour and costs	5c per day
Each 1-16 inch leak wastes	34 gallons per hour and costs	21c per day
Each 1-8 inch leak wastes	137 gallons per hour and costs	86c per day
Each 1-4 inch leak wastes	514 gallons per hour and costs	\$ 3.21 per day
Each 1-2 inch leak wastes	2057 gallons per hour and costs	\$12.84 per day



Showing that a leaking tap means leaks in cash and continuous leaking will often result in ruin to the fixture, whereas, repairs in time would save it.

leak is discovered it is attended to at once there is no danger of the seat in the valve being destroyed. But if, on the other hand, these valves are allowed to go on leaking, in a very short time the valve has to be replaced, often costing 3 to 4 dollars, besides the cost of water already wasted. Of course, the public as a whole do not see the matter in that light. Hence it is the duty of the sanitary engineer to point these facts out. Another view to be taken of this matter is: When a customer makes a call at your store and asks you to put

in a new cock or w.c. tank valve, always induce them to put a good one in: show how easy it is to add the price on a poor article in a very short time by having to repair it, and you will invariably find that your customer will take the higher priced article. They get the valve right there, and at the same time are being a party to decrease the amount of money which is having to be spent from time to time by our "city fathers" to keep up the demand, of which a large portion is for leaks.

Public Comforts Dire Necessity

No City Should Lack Public Comforts—Railway Companies Cater to the Public, and so Does the Bar-room, Yet Few Suitable Conveniences Are Provided for Respectable Citizens.

IN reading various daily papers we find that the Montreal Council are considering the question of building several public comforts in that fair city. Such a move should receive the support of every citizen, not only in Montreal, but in every city in Canada. It is an awful condition that exists through the fact that there are so few in our cities. Montreal, we understand, can only lay claim to one such building. Toronto has quite a few, but one could travel for days on the way to and from business and not pass one. Ottawa is practically without any and when we look at other countries where each city has public lavatories in every locality, it seems too bad that new cities are being built up without them. Such a state of affairs would be apt to lead one to believe that public lavatories were a nuisance from the fact of their being eliminated in our new cities. What are our city engineers doing? Why are these conveniences not provided for when

streets, roads and avenues are laid out? Here is a chance for sanitary engineers to put in a word or two. We hope ere long to see them taking a hand in such schemes and in that way becoming more popular with the public. What would happen if the railway companies were to build cars without lavatories? The whole country would be up in arms and rightly so, yet every city is far more guilty than a railway company would be if they did not provide such conveniences.

Public comforts are, in actual fact, more necessary than lavatories in a railway train, seeing that the majority of those who travel on a railway are only confined for a short period, though of course, some are for a longer period. But speaking for the majority of travelers, they are practically resting, therefore can dispense with the use of a lavatory for a longer period than persons who are in action, traveling from place to place around and along our city

streets. Thus it can plainly be seen that public comforts are very much more necessary than lavatories in a railway, yet there are fewer in our cities. Now, as we said before, this is a problem which sanitary engineers should take up. They should get suitable fixtures in their show-rooms; they should call the attention of the manufacturers of sanitary goods to put up a display. Why not arrange for an up-to-date installation being placed in our coming National Exhibition, and in that way show the possibilities of a good public comfort station?

In Toronto we boast of having the finest exhibition grounds in the world, but we can by no means boast of the public comforts that are situated in these grounds. They are a disgrace, to say the least, and must be a source of continual expense. In every city in Canada the same conditions exist. The railway companies are setting an example by the way they cater to the comfort of the traveling public, by installing beautiful places of convenience at each station. But as citizens we sanitary engineers are slow in not voicing the matter of public comforts more strongly. Not very long ago one of our most able medical practitioners stated that he would condemn every residence as being unfit for human habitation unless it had a bath in it. And Sanitary Engineer states right here that any town or city which is not well supplied with public comforts is not fit for human habitation. We reproduce, with this article, a newspaper clipping showing what a farmer's wife thinks of the question.

Hotels and Lavatories.

Editor World: I am writing as a farmer's wife to tell you of one reason why the bars are a great boon to farmers and their sons. What would they do without the lavatory accommodation in connection with these bars? The city of Toronto has the worst accommodation in that way of any city of its size on the continent, so travelers say. I agree with the man who wrote that the W.C.T.U. ladies had better do less praying and more work and start an hotel in the center of the city with large public lavatories in connection.

Jessie Amelia Jones.

Weston, July 4.

The above is a clipping which appeared recently in the Toronto World.—Editor.

Practical Problems for Sheet Metal Workers

Developing Chimney Tops, Etc.

By E. J. Bronson

IN the problems shown here are a number of different styles of chimney tops. As conditions are not always the same, it is always necessary to put on a top to suit peculiar local conditions. At other times a certain design of vent or chimney top is asked for.

In Fig. 1 is shown the ordinary cone cap over the end of the pipe. To develop the pattern for the cone, the elevation gives the necessary radius, with A as a centre, and A B or A C as a radius describe a circle, as shown by E F G. Divide the outer circle in the plan of top into an even number of parts and space off the divisions thus obtained on circle E F G, as shown by the figures E 1 2 3 4 5, until the full number is marked off to G. From the points E and G draw a line to the centre A, thus completing pattern of top. With A on cap as a centre and A D as a radius strike another circle on the pattern, as shown by the letters H K L. This line can be used for the purpose of keeping the braces,

which are shown by the dotted lines in their correct positions.

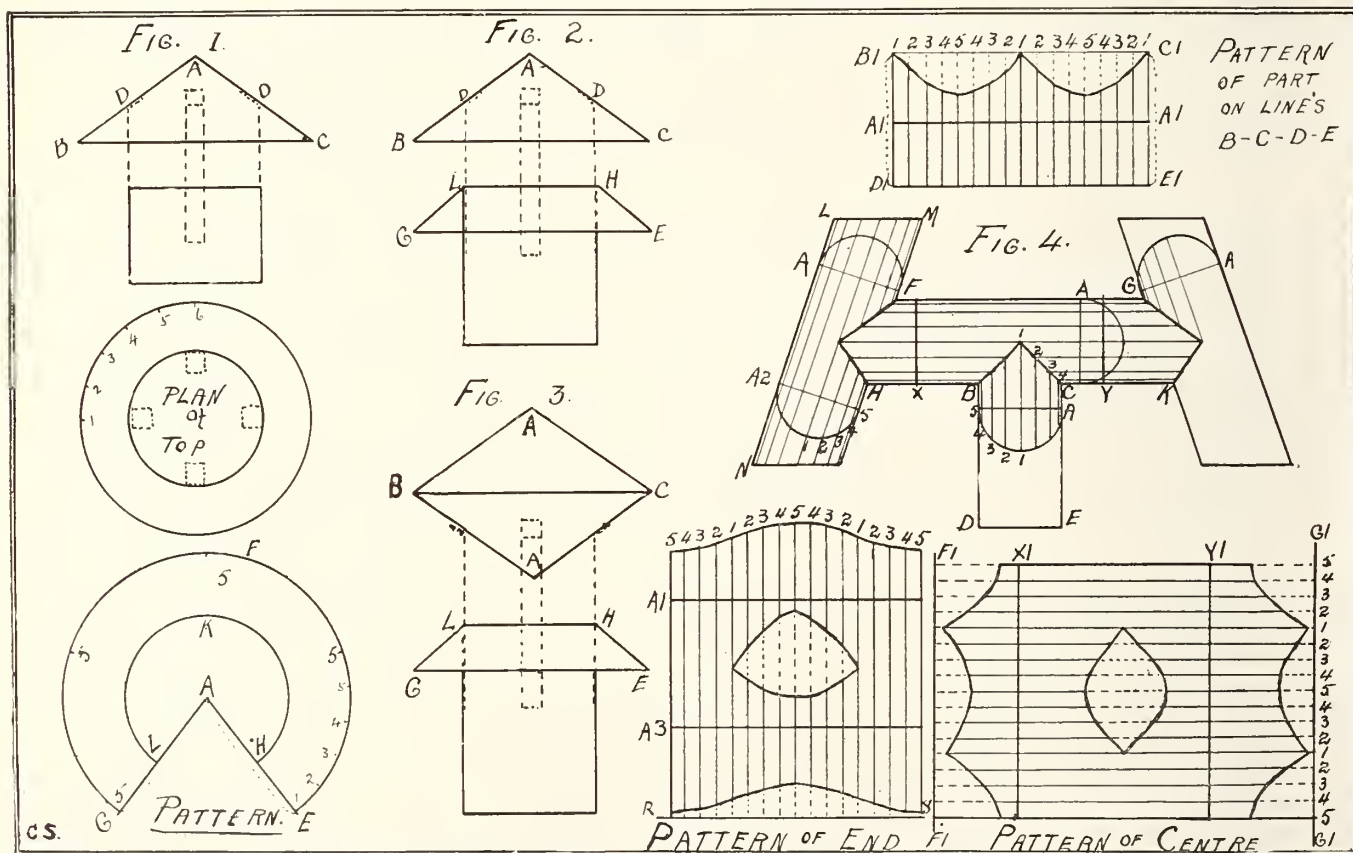
In Fig. 2 is shown a cap similar to the one shown in Fig. 1. The pattern is developed in the same manner, the pattern of the top being the same, and the pattern of the lower collar being outlined, as shown by the letters G F E H K L in pattern of Fig. 1.

In Fig. 3 the top consists of two cones put together base to base, the pattern for each cone being developed the same as cap shown in Fig. 1. The collar on the top of the pipe is the same as shown in Fig. 2, and is developed in a similar manner.

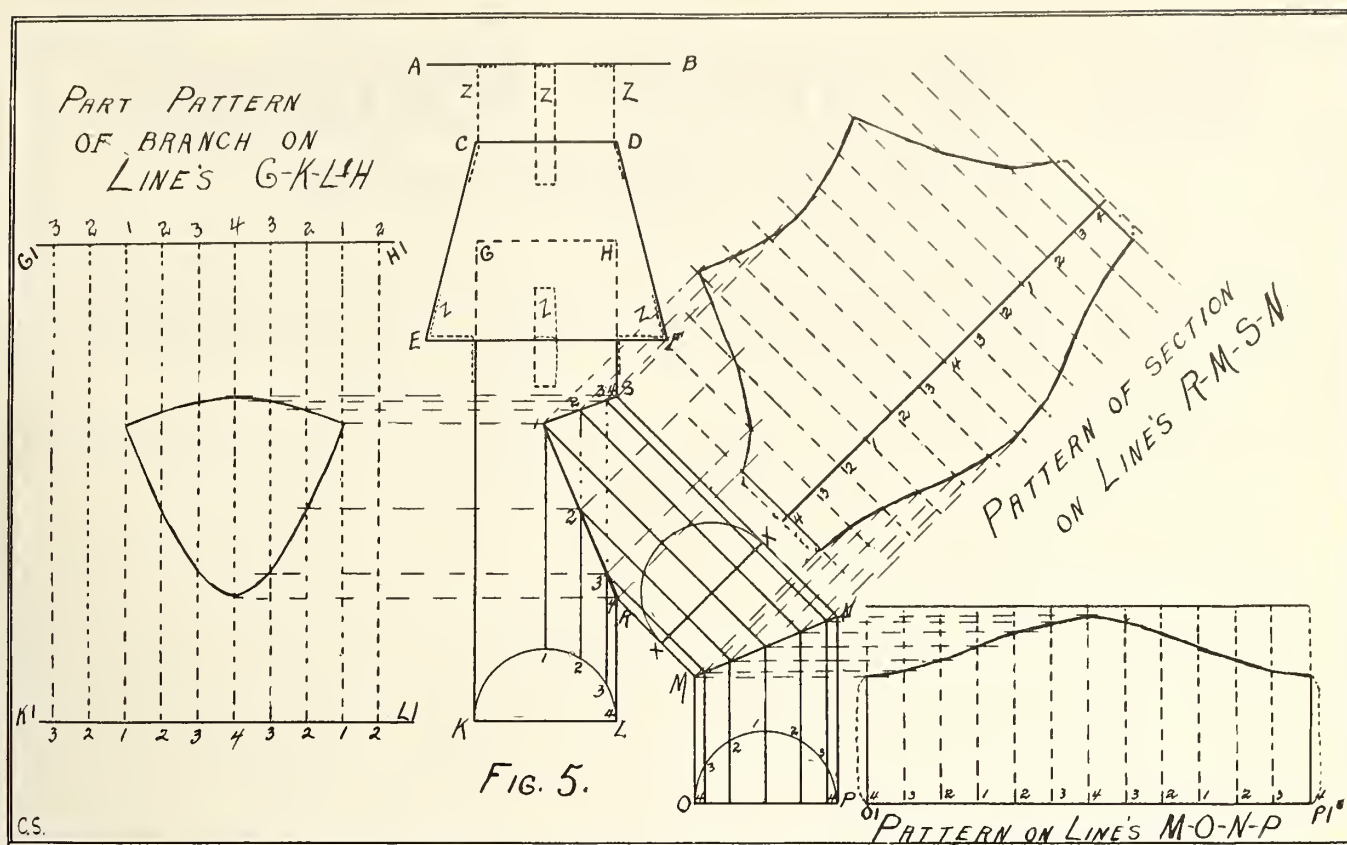
In Fig. 4 is shown a top made of a double tee pipe.

To develop the patterns for one, as shown in Fig. 4, it is first necessary to find the mitre lines or junctions between the different branches. In or on each section draw a circle or half-circle of the diameter of the pipe, as shown by the letters A A. Divide these into an equal number of parts, as shown, and

from the points thus obtained draw lines parallel to the sides of the pipe. As all the branches are of the same diameter, the centre line of each branch is continued on until it joins the centre line of the one crossing it, and the corresponding lines on either side joining in a similar manner, No. 1 to 1, 2 2 3 3 4 4 5 5, as shown at each of the three joints. A line drawn through the points thus obtained gives the mitre line. Having obtained this, we can now develop the patterns. First the part outlined by the letters B C D E, draw two stretchout lines as B1 C1 D1 and E1. With the compasses set off the spaces on half-circle at A, on line D1, E1, as shown by the figures 1 2 3 4 5 4 3 2 1, repeat so as to make the length for circumference complete. From these points draw lines at right angles to D1 E1 until they meet C1 B1. As it is not necessary to draw this part full length, we will take the distances from line A A, draw a line through stretchout, as A1 A1. With the compasses take the distance on line 1



Developing patterns for various styles of chimney or ventilator tops.



Developing patterns for various styles of chimney or ventilator tops.

from line A A to where it meets line 1 on branch, and mark off same from line A1 A1 on corresponding numbers on stretchout, continue with the other spaces in a similar manner. A line drawn through the points thus obtained on the stretchout will give the outline of pattern required. The next step is the centre part, as outlined by F G H K. Draw two stretchout lines, as F1 F1 and G1 G1, a distance apart at least equal to length of centre part, and on these stretchout lines set off the spaces on half-circle at A, repeating until length for circumference is complete, as shown by the figures 1 2 3 4 5 4 3 2 1, etc. As points from which to work from, draw lines on centre part, as shown by X X and Y Y, draw two lines through stretchout, as shown by lines X1 X1 and Y1 Y1, keeping them the same distance apart as X X and Y Y. Working from the line X X, take the distance on line 1 to line 1 on branch crossing centre part, and set off same from X1 X1 on line 1 of stretchout, and continue with spaces 2 3 4 5 in same manner. It will be noted that the lower half of pipe is kept in centre of pattern and the top half on the edges; this enables you to keep the opening for branch clear of the locks on circle of pipe. Proceed in the same way from line Y Y for the opposite end. To obtain opening for branch, measure back with compasses from lines X X and Y Y on the lines 1 2 3 4 5 to mitre line in centre and set off on corresponding

lines of stretchout. The two cross-pieces on the ends being the same as one another, it will only be necessary to develop the pattern of one, as outlined by L M N O, Fig. 4. Draw a stretchout line, as R S, and on this line mark off the spaces on half-circles at A until length for circumference is complete, as shown by the figures 5 4 3 2 1 2 3 4 5, etc. Draw lines from these points, at right angles, to R S, drawing them at least as long as line L N. Working from line A, measure distance on line 1 from line A to line L M, and set off from line A1 on stretchout line 1, as shown; continue with other spaces, keeping the spaces that bisect the mitre line in centre of pattern, so that opening for branch can be kept clear of lock joint on pipe. Proceed in same manner from line A2 and set off from line A3 on stretchout.

To obtain outline of opening for branch measure from line A to points where lines 1 1 meet and set off from A1 on line 1 on stretchout 2 2, 3 3, 4 4, 5 5, proceed from line A2, and set off from line A3 in same manner. A line drawn through these points will give outline of opening for branch.

The top shown in Fig. 4 is also made in other forms besides, as shown here. Some prefer to have the arms at outer edge parallel with stack, etc.; the method of developing pattern in any case would be practically the same.

The top shown in Fig. 5 is one not often used. Its particular advantage is

that it can be used on the chimney on a building where the adjoining one is much higher. Its use does away with the necessity of an extra long stack. This design has been illustrated before, but we have made and erected one under above conditions, and it gave perfect satisfaction. In developing the patterns, the first step is to draw an elevation or side view, as shown by A B C D E F G H K L R S M N O P in Fig. 4. The next step is to obtain the cutting lines for the bevel at M N and the branch at R S. To obtain these, strike half circles, as shown at O P and K L. Divide these into equal number of spaces. From these points draw lines parallel with sides of pipe, until they bisect mitre line at M N, and the lines from corresponding points meet at branch at R S.

A line drawn through the points where lines meet gives the necessary view of mitre or cutting line. To develop the part shown at M N O P draw a stretchout line as O1 P1, on which set off spaces required for circumference. From these points and at right angles to stretchout line draw lines, as shown by dotted lines, with the compasses set off the distance from line O P to mitre or cutting line M N, beginning at space 4 at O and set off from stretchout line on first space line at O1; repeat with the others, and after measuring and setting off the space 4 at P M, work back again to O M to make

(Continued on page 22).

The Sanitary Engineer

Plumber and Steamfitter of Canada

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TORONTO, SEPTEMBER 1, 1914

WAR PANIC DISORGANIZING BUSINESS

THE principal developments to be noted since a general European war became an accomplished fact, are those in which business interests predominate. A real, live panic has got hold of the Canadian people, and as a result there is a tendency in industrial circles for the managements to cut loose, burn their bridges, sit tight and conserve their present resources. On another column of this issue much sane advice by the noted economist Sir George Paish, is compressed into small space. One thing that strikes us as regards the situation created by the war, and which may be read into Sir George's statement is that the public weal should at all hazards be conserved.

Industries have without doubt been directly affected as a result of the outbreak, but amid all the panicky pessimism, there is no real outlook to warrant a stoppage of the productive power and income of our country. It is a time more than ever before which puts our Captains of Industry in the limelight and on their mettle, and just as we unhesitatingly look forward to the triumph of our Empire in its titanic struggle for right and freedom, we likewise predict that our manufacturers will not fail by their actions and attitude during the crisis to merit the universal commendation of the Canadian people.

WE MUST CO-OPERATE

THIS is a period when every ounce of enthusiasm and inspiration should be allowed to play its part.

Were it not for the inspiration of our cause, were it not that we are fighting the good faith with all our might, we could not become enthused. We must also co-operate with each other in every word and deed. Co-operation is not a sentiment. It is an absolute necessity.

It is necessary for the strong to enthuse the weak. The employee should be ready to work harder so that every employer can cope better with financial difficulties. There are more sides than one to a war. Here we, as a nation, are at war. We are proving ourselves to be more human than we are apt to be in times of peace, showing that there is the humane side to war as well as the inhumane, and while we have sent troops to wage war against a feudalistic monarchy we must do all in our power to keep our workshops open, our factories running, and our various business

enterprises moving on. If we become faint-hearted, we shall only be bringing greater woe upon our nation. Businesses must not be closed down because they cannot be run on a cash profit basis, but must be continued rather with a view to keep them in order. There is greater deterioration taking place when a business closes, than can possibly take place when kept running. And when this war is over, Canada will have to supply world-wide needs. Then she must be ready. Therefore let us bear in mind that our every move should tend towards keeping our industries running, even though those industries may have to be run rather for a purpose than for a profit.

DISPLAY CONFIDENCE

THE "London Statist" of August 1st, 1914, says: "In the unprecedented and critical situation that exists, it is of the greatest importance that every one should endeavor to act as if great events were not impending.

"Were confidence to be seriously disturbed, business would come practically to an end, and our ability to face the difficulties that may be in front of us would be seriously impaired.

"Therefore, it is of vital importance that as far as possible, the events that are now taking place should not interfere with the daily life and the daily work of the nation. Orders should be given, factories should be run, everything should be arranged to maintain, as far as possible, the productive power and the income of the country.

"But for this to be accomplished the situation must be faced with courage and confidence on the part of everyone. Investors must continue to invest, bankers must continue to lend, the stock exchange must continue to deal, and everyone according to his ability must endeavor to work hard in order that individual incomes, and therefore the income of the whole nation, may be maintained at the highest possible level.

"A little over a century ago, when the nation was at war with Napoleon, its income was a very small one, being less than one-eighth of what it is at present, and in a comparatively small space of time the British people succeeded in raising about £1,000,000,000 of money for war purposes, and so great was their confidence and courage that at the end of the great war, which severely taxed their resources, they were stronger and wealthier than they had been at the beginning."

WAR BRINGS INCREASED REVENUE

ALTHOUGH literally speaking, the time to make hay is while the sun shines, figuratively, it may be made at any time. We need not lay ourselves specially out for the purpose either, although perhaps as individuals such a proceeding would probably be necessary. Our patriotism, if worthy of the name would, however, be a sufficient deterrent in these stirring times

While Canadian manufacturers and industrial concerns generally have been more or less adversely affected by this world-involving European War, it is worthy of note that our great public utility corporations are being affected beneficially, a condition of things likely to exist until long after peace is declared and until trade and commerce get back again to normal. The highly satisfactory part of this experience is that no special effort has been made to secure the increased business, therefore no imputation of sharp practice, meanness or lack of patriotism is applicable

By reason of the war the revenues of certain corporations in Toronto have increased considerably. The Bell Telephone Co. state that calls have increased about thirty-three per cent., the greater number of these extra calls being to the newspaper offices. Towns outside Toronto have also sent in additional long-distance calls, the increase being reckoned at about ten per cent. The lines of the telegraph companies have also been exceptionally busy, their revenue showing an increase of twenty per cent.

The business of the cable companies has increased about ten per cent., although the number of cables was not as large as before. The fact that addresses and signatures had to be given in full has augmented the revenue. Another corporation that has scored heavily is the street railway. The war bulletins and special editions of the newspapers have brought thousands of people down town, who in the ordinary course of events would have stayed at home. It has been estimated that the additional profits of the street car company amount to some \$5,000 per day.

What is true of Toronto is without doubt the experience of the public corporations and municipally owned utilities in the principal cities and towns of the Dominion. As a consequence we think it right that the attention of the various executive bodies who are planning Empire aid in able-bodied men and material, who are taking steps to succor the wounded and dying, and last, but not least, who are planning to keep the wolf from the door of homes from whence the bread-winner has gone at his country's call, should be drawn to this phase of the situation so that a share in the profit arising from our Empire's fight for liberty, be forthcoming to further and bring that fight to an early and successful conclusion, and with the minimum of suffering and inconvenience.

This is no time for hoggishness, individual or otherwise. Practical demonstration was given a few days ago, here in Toronto, of what individualism can achieve.

SOME CURIOUS NOTIONS

IT is curious how long a theory that has been put forward with a show of plausibility, will cling to our minds, even after it has been exploded by unquestionable scientific proof.

Some people will even go so far as to seriously resent any attempt to disprove an old time worn theory

which they have always believed to be true. For several thousands of years it was believed the world was flat and that the sun and moon traveled round the world, that the speed of falling bodies was governed by their weight; but it occurred to Galileo to explode this latter theory, which he did by dropping two stones of unequal size from the top of the famous leaning tower of Pisa. And to the great astonishment of each beholder, both stones reached the ground at the same instant. More astonishing still is the fact that the great scientists who witnessed this experiment went away unconvinced, and proceeded to persecute Galileo for his attempt to destroy their time-worn, though cherished theory.

AN AGE OF CONSERVATION

THIS is an age of conservation, of life, of resources, of vitality, yet in spite of the fact, we are not by any means conserving material to any great extent. We are rather spending too much money, and too much labor. For instance, look at the amount of tin there is at present locked up in heavy wiped joints, we venture to say that 15 per cent. of it could have been conserved, and it is of no value to-day, whereas tin ingot is at present quoted as being worth from 60 to 70 cents per lb. A heavy joint is of no more economic value than a light one, providing the light one is the same average thickness as the wall of the lead pipe which is joined together.

CANADIAN NATIONAL EXHIBITION

THE great Canadian National Exhibition opens in Toronto on Saturday, August 29, and lasts until September 14. This event has developed into the greatest annual exhibition on the globe, and it is a great privilege—to those who have the opportunity—to attend it.

In this age we live to learn. The more we know and the better we utilize the knowledge at our command, the greater will be the pleasure derived from the work we have set out to do. Someone has stated in epigrammatic language that "the more we learn the less we know." And it is a fact sometimes that when people see the greatness of things at such an exhibition as the Canadian National, they realize the smallness of the local sphere around which things have been revolving for them.

EDITORIAL COMMENTS

"COURAGE with confidence."

WATCH the market closely.

CANADA IS BOUND to profit from the eruption of the peace of Europe.

INVESTIGATE the advertising pages of this number. They present new opportunities to you.

THE COMMERCIAL traveler is generally a mine of information in his particular line. As a rule he is a "jolly good fellow," and it doesn't require much pressing to get him to give valuable suggestions. Just ask him a few questions. He will be only too glad to assist you.



FORT WILLIAM PICNIC.

This is picnicking time with the craft all over Canada, as will be seen by the various reports we have received recently, and Fort William sanitary engineers were lacking nothing at their picnic recently held in King George Park, which is situated on the Mount McKay and Kakabeka Falls railway. It was "some picnic," we are told; they carried their traps with them on this occasion. It's not often they do "take their traps with them," they generally leave them at the shop and send the helper back for them. (That's the impression of the public anyway.) But if we go along in this strain we'll be "talking shop," and that's "strictly" forbidden at a picnic. However, when this jovial brotherhood of the "lead pipes and tap washers" arrived at the King George Park the fun began. Some "piped lays" of various kinds, others vented their "traps," "beg pardon," their feelings, I mean, and others indulged in a good old smoke test. No water test would satisfy the boys on such an occasion. There may have been one or two peppermint tests indulged in by the ladies and children present, but no doubt the smoke test would hold sway with most of the boys.

Picnics and social events are the best kind of gatherings which tend to cement the trade and its members into one consolidated whole. "So let 'em all come

and come often, so that we can all come often to them."

If you've got a grouch in your top go to a "plumbers' picnic" and be subjected to a smoke test.



SANITARY REGULATIONS.

Sanitary regulations are becoming more and more scientific in all armies. Personal cleanliness is insisted on, and water supply, disposal of waste, and all activities are carried on in a hygienic manner. The Japanese were the first nation to perceive the importance of personal cleanliness. They are the cleanest people, physically, in the world today. Every Japanese while at home takes several baths a day. When Japan was at war with Russia every soldier had to follow strict bathing rules. Just before every battle he had to take a bath with some disinfectant and don clean, freshly boiled clothing. They obeyed with patriotic fidelity, and the result was that when the Japanese soldier met his less-clean Russian enemy he had on a new kind of armor—a carbolized skin covered by a clean shirt. The Russian usually was unbathed and clad in garments which certainly were not sterilized. When the bullet struck the Russian it penetrated a germ-laden garment, passed through a germ-covered skin, and

carried many bacteria on bits of clothing into his body, seriously affecting him. The Japanese soldier received his bullet through a clean garment and a clean skin, and only clean fragments of clothing came in with the bullet. It was an aseptic operation, and the Jap quickly recovered."



CLASSES OPENED IN SANITARY TRAINING.

The sanction of the B. C. Council of the Royal Sanitary Society of England has been obtained, and the formation of classes for the purpose of training the absolutely untrained but willing help towards becoming useful members of a volunteer sanitary corps, and consist of two units, one composed of men and one of women. No trained nurses can join, as these can find excellent work in other spheres of action. Nurses can volunteer their services in case of necessity, but they cannot join as members of the corps. The idea is to show what can be done with absolutely untrained but willing help.

We do not know in this hideous war what is before us; at any moment the public health authorities may require large additional assistance, and those who take the proper three months' course of training and pass the final examination will be enrolled in the V.S.

SHEET METAL WORKERS.

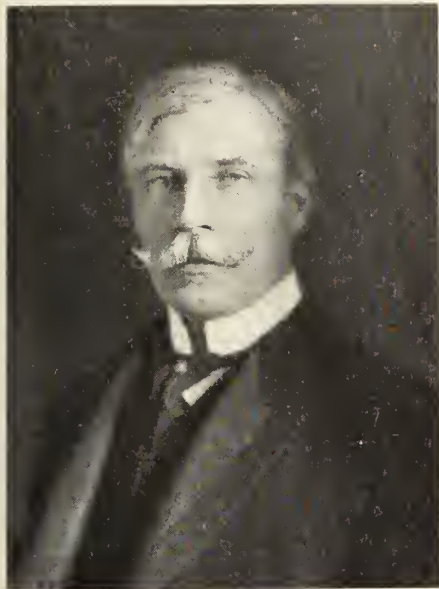
(Continued from page 19.)

opposite half of pattern. A line drawn through the points thus obtained will give outline of pattern on lines M N O P. The part shown by lines R S M N is dealt with in the same manner as just detailed for lower section, the stretch-out line is spaced off, and lines drawn at right angles to it. In this case the section shown has a cut on either end, so that lines require to be drawn on both sides of stretchout line. Beginning at space 4 at R, measure the distance from point R, measuring line X X; set off this distance from stretchout line on first line drawn from the stretchout line; repeat with spaces from 3 2 1 2 3 4. After marking off the distance from point 4 at

S, work back over the same spaces to point R, and set off on pattern until complete. The cut at M M is measured and set off in the same manner. Lines drawn through the points thus arrived at will give an outline of the required pattern. The section shown by G H K L is formed of a straight piece of pipe. The opening required for branch can be made before it is formed up. To obtain outline, it is only necessary to work on part of section; space off at least one-half the circumference, as shown at G1, H1, K1 and L1. Working from line K L, measure from line K L to point 1, where the two centre lines meet, and set off from K1 L1; on space line numbered 1, measure to point 2 on lower half of mitre line, and set off on space lines numbered 2, measure to point 3, and set off on lines num-

bered 3, measure to point 4 or R, and set off on line numbered 4. This will complete lower half opening. Measure from K L to point 2 on line from point 1 to point 4 at S, and set off on lines numbered 2; measure off to point 3, and set off on line numbered 3; measure off to point 4 or S, and set off on line numbered 4. This will complete upper half of opening. A line drawn through the points will show outline complete. The section C D E F is developed, as detailed for collars on caps in Figs. 2 and 3. The section at A B is a disc or round plate of a diameter equal to the distance from point A to B. The dotted lines at Z show the braces which are made of light band iron. The Fig. as outlined by A B C D E F G H K and L can, of course, be used without branch on side, and in ordinary cases gives good results.

Corps and receive a certificate to that effect. It is hoped to be able to obtain from England a special war service diploma for these volunteers. If the health department can call upon a reliable trained corps such as it is proposed to establish, what a good example Vancouver will have set other cities in this matter.



JAMES M. ROBERTSON.

President and general manager of Thomas Robertson & Co., Ltd.

Officers of Thos. Robertson Company.

James M. Robertson, the newly-elected president and managing director of Thomas Robertson & Co., Ltd., Montreal, takes with him in his new duties the experience of forty-four years' association with the company and consequently a broad knowledge of many of the branches of the metal trade.

Mr. Robertson has seen many changes in the business in which his firm has for so many years played a very prominent part in Canada. Launched in the year 1853 by John Wilson and Thomas Robertson, under the name of Thomas Robertson & Co., there were many years in which practically all of the stock-in-trade had to be imported from England and Europe; to-day the bulk of the importations of iron and steel are brought in from the United States. Likewise manufactured articles and supplies were largely secured from the old land, for there was a limited supply to be had in this country where manufacturing was just in the beginning in the metal trades.

In the early days of the experience of Mr. Robertson, Montreal was much more important comparatively in the metal trades than it is to-day, and there were three or four times as many houses engaged in the business than there are to-day. The prosperous manner in which this firm has survived and enlarged is a

tribute to the men who have been at the head of the concern and the policy which has been adopted. Half a century ago practically all the metal in the raw state or manufactured coming into Canada had to come through Montreal; since that time there have been many changes.

Mr. Robertson succeeds the late president, James Reid Wilson, who entered the business at the same time as himself, the original partnership having been formed by their fathers.

John Wilson, son of the late James R. Wilson, who has been a director of the company for the past five years and who has been associated with the firm for eight years, is the new vice-president, while the vacancy on the board of directors has been filled by S. R. Brewer, who for the past twenty-one years has been connected with the company both on the road and in the office. Mr. Brewer has been secretary-treasurer and he will continue the duties of the office he has been so ably filling.

H. W. Anthes "Passed On."

Mr. H. W. Anthes, managing director and secretary-treasurer of the Anthes Foundry, Limited, of Toronto and Winnipeg, Man., died suddenly at his island home, Georgian Bay, recently. The body was brought to Penetang by the steamer Waubie for interment in Toronto.

Deceased, who was in his sixty-fourth year, was widely known in this province and in Western Canada, and his "passing on" will be greatly regretted by one and all who knew him. He was born in Wilmot township, Waterloo county, in the year 1851. He was originally connected with many prominent business firms in Toronto, moving in 1880 to Berlin, Ont., and subsequently returning to

Toronto in 1889, where, with Mr. E. W. B. Snider of St. Jacob's, he established what is now known as the Anthes Foundry, Limited, with plants at Toronto and Winnipeg.

The late Mr. Anthes leaves a widow; two daughters, Mrs. Herbert A. Locke,



THE LATE H. W. ANTHERS.

32 Howland avenue, Toronto, and Miss Libbie F. Anthes, and one son, Mr. L. L. Anthes, who was associated with him in the business. Mr. J. S. Anthes, of the Anthes Furniture Company, Berlin, and Mr. J. I. F. Anthes, Manager of the Dominion Tire Company, Berlin, are brother and nephew, respectively. Mrs. George Strasser of Sebringville, Ont., is a sister. Deceased was a member of Harmony Lodge, A. F. & A.M., Antiquity Chapter and Cyrene Preceptory.

NEW GRADING RULES ADOPTED BY THE MANUFACTURERS OF

Enameled Iron Sanitary Ware

High-Grade and Five-Year Baths must be well coated with enamel of uniform color or tint, as evenly and smoothly applied as the limitations of the art with the best skill will permit. Goods will not be rejected for mere unimportant blemishes. Small, fine specks of foreign matter in the enamel cannot be entirely prevented, and are not a valid cause for rejection. **Absolute Perfection is not guaranteed or commercially possible.**

All Small Ware (lavatories, sinks, etc.) same grading as **High-Grade and Five-Year Baths**, but on the less important or cheaper patterns, the inspection will not be as close or as exacting.

Two-Year Guaranteed Baths—Laundry Trays and Flat Rim Sinks—the same general rule applies to this Grade as to the **Five-Year Baths**, except the enamel may not be as heavy or as smooth a coating. It may be of less uniformity in color and tint. Unimportant blemishes, such as two or three pin holes, minute scratches or lines, or small specks of foreign matter in the enamel which cannot be entirely prevented will not be a valid cause for rejection.

Automobiles From \$25 to \$35 Each.

The first domestic sanitary and heating engineer to open up in Estevan, Sask., was C. H. Armstrong. He went there in February, 1913, and has achieved most fame in Saskatchewan through an automobile, now deceased. To run a twenty-five dollar motor car around town to advertise a plumbing business is something novel. A local firm of machinists had an old Cadillac on their hands, and could do nothing with it. Armstrong gave them \$25 for it, spent half a day's labor on it, and used it for a year to haul his supplies around town. As there was no muffler on it, a stranger would have thought two freight trains were coming down the street when this old Cadillac got started. After a year, he pulled it to pieces, and sold it for repairs, keeping the engine, and getting \$35 for the remainder. He has since put in a bid for a car to take the place of this one. He has offered \$35. Looks as though Estevan may soon have another "puffing Billy" running around.

C. H. Armstrong served his time in Victoria, afterwards working with Ed. Peach and Barr and Anderson as improver, later moving to Seattle. One summer he went to Juneau, Alaska, and worked for the town engineer installing a pumping plant. He also was employed by the engineer of North Vancouver enlarging the waterworks. Before starting in the plumbing business at Estevan, he did a little farming at Melita, Man.

He says he spends about as much time collecting his debts as he does on his plumbing work. The population is composed of American Swedes mainly. He says that outside the Catholic priest and four others, the people who require plumbing done in that town would rather not pay for it hurriedly. Swears he never had a tinsmith who was not a booze-fighter, but has no difficulty in securing sober plumbers. His only opposition is from a local hardwareman.

The Plumber.

The plumber came down like a wolf on the fold.
And his pockets were bulging with silver and gold.
Nine hours and a half he made love to the cook.
And twenty-one shillings he charged in his book.

LORD TENNYSON.

We thought "Lord Tennyson" was dead, but it must be his "spook" which must have crossed the bar (not yet abolished).—Ed.

How Saws are Made.

Henry Disston & Sons, Philadelphia, Pa., and Toronto, Can., have just issued

a booklet entitled "How a Disston Handsaw is Made." The booklet is attractively gotten-up and illustrated and explains the various processes of manufacture. Copies of the booklet will be supplied free to the retail trade for distribution among customers.

and safer to burn the whole service after each meal.

Takes a Trip.

C. T. Bull, sanitary engineer, St. Thomas, is in Winnipeg on a two weeks' trip.

Name and Address of Ontario Society Permanent Secretary.

We have received several requests from time to time for the name and address of the permanent secretary for the Ontario Society of Domestic Sanitary and Heating Engineers, which is G. F. Frankland, 1093 Bathurst Street, Toronto. —Editor.

Burn Your Dishes.

The American paper cup threatens to invade England, and with it the paper plate and the paper tumbler. A speaker at the recent Blackpool sanitary conference sounded a warning against crockery. The best washed dish, he said, retains some germs. It is cleaner

Why Many Fail in Business

Because They Figure Their Profits Incorrectly

THE RIGHT WAY**EXAMPLE:**

Expense of doing business is 25%
(Figured on Gross Sales, i.e., selling price.)
It is desired to make a profit of 10%
(Must be figured on selling price.)
Cost of an article is \$2.00

Find the SELLING Price**SOLUTION:**

Selling price =	{	Expense	{	Rent	{	Delivery Charges
				Light		Telephone
Profit	{	Cost	{	Heat	{	Int. on Capital Invested
				Wages		Depreciation of Stock
Cost	{	{	{	Advertising	{	Bad Debts
				Insurance		Extraordinary Expense
Freight	{	{	{	Express	{	

100% equals Selling Price
35% equals } Expense 25%
Profit 10%

65% (of selling price) equals Cost

\$2.00 will be 65% of selling price

Divide \$2.00 by .65 equals \$3.08

ANSWER:

Selling Price should be made \$3.08

PROOF:

Expense	25% of \$3.08 equals	. . . \$.77
Profit	10% of 3.08 equals	. . . .31
Cost	65% of 3.08 equals	. . . 2.00

Selling Price 100% equals . . . \$3.08

THE WRONG WAY

Figuring it as 25% plus 10%, or	. . . . . \$2.70
which is less than Cost	. . . . . \$2.00
plus Expense	. . . . . .77
	} \$2.77

THAT'S WHY THEY FAIL

New Sanitary and Heating Goods

NEW RADIATOR RETURN VALVE.

In these days of conservation, every manufacturer is looking into the merits of every commodity he produces, as well as into new lines which have for their chief features the idea of conserving. One of the latest products in the heating line is a new radiator return valve which is being manufactured and sold by the James Robertson Co., Ltd., Toronto. This valve will close to steam, thus conserving steam, and will open to water, thus increasing the efficiency of the radiator.

enormous expansive property, to overcome the pressure tending to open it. Air again exerts a certain closing effort but insufficient to seal the valve tight, therefore the air or gas passes from the radiators.

This is an instance of theory being applied in such a practical device that it fills a long-felt want and gives us a sturdy, durable valve of high efficiency.

* * *

New Floor Plate and Hanger Catalogue.

One of the most attractive catalogues ever issued which deals with floor plates,



New radiator return valve. Will close absolutely to steam and open to water.

Steam heating to be efficient must be economical, uniform throughout the building, and silent. A minimum of water in the system—one radiator not short-circuiting others—air binding and water sealing eliminated. This can be attained by checking the steam on the return of the radiator and passing the water.

The most practical method of separating condensation from steam is by their physical differences (their temperament may be the same), and that determines their difference in velocity of discharge from an orifice.

A close scrutiny of accompanying cut shows a cone-tipped valve sliding freely on a guide which acts as the cap or plug; the water discharges from the orifice in a solid, steam opening this valve wide. The steam, on the other hand, induces sufficient suction between the seat and the valve, by virtue of its

hangers, air valves, etc., is being sent out to the trade by the Beaton & Cadwell Manufacturing Co., New Britain, Conn., U.S.A. It describes their products in such a way as to make the book of great value to the sanitary, heating and ventilating trade, and should by all means be on the catalogue shelf of every one engaged in this calling. These catalogues

A Communication to the Trade NON-GUARANTEED BATHS

THIS is to advise you that we have discontinued the manufacture and sale of the Non-Guaranteed Grade of Bath, known under our Trade Names of "Patricia," "Leader" and "Acme."

We will, until further notice, furnish our Blue-and-Red Label Baths, namely: "Stanley," "Tuscan" and "Douglas" at the same prices we have been selling the cheaper grade at.

The Standard Ideal Company, Ltd.
Port Hope, Ontario,
Canada.

August 24th, 1914.

may be procured free by writing to the Beaton & Cadwell Manufacturing Co., New Britain, Conn., U.S.A.

* * *

New Fitters' Manual.

If there is one thing more than another that has improved lately it is the style and get-up of catalogues and booklets which manufacturers have sent out recently to the trade, and THE HONEYWELL HEATING SPECIALTY CO., OF WABASH, IND., have not failed by any means in putting before the profession their Fitters' Manual. It is not only well gotten up, but is full of good sound logic. It is full of valuable information—information which not only applies to their new methods of hot water heating, but also practical truths applicable to the trade as a whole. Any heating engineer who does not possess one of these manuals is lacking a valuable book, which may be procured free by applying to THE HONEYWELL HEATING SPECIALTY CO., WABASH, INDIANA.

LETTER OF APPRECIATION.

Editor Sanitary Engineer:—

Enclosed you will find order for the amount one dollar for Sanitary Engineer for 1913 to 1914. I have received copy regular every two weeks and have derived much benefit from same. Kindly continue sending same to my address.

Yours truly,

J. M. CONLEY,

Box 135, Lindsay, Ont.

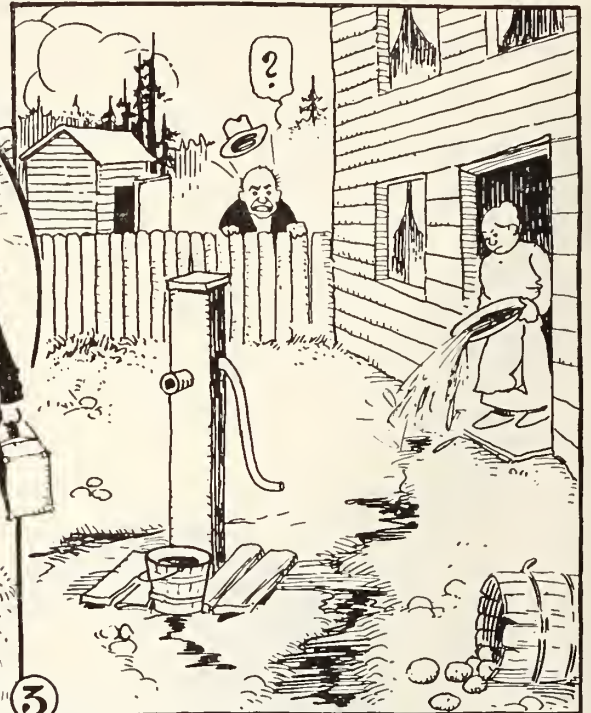
A Sanitary Engineer's Experience in the Country



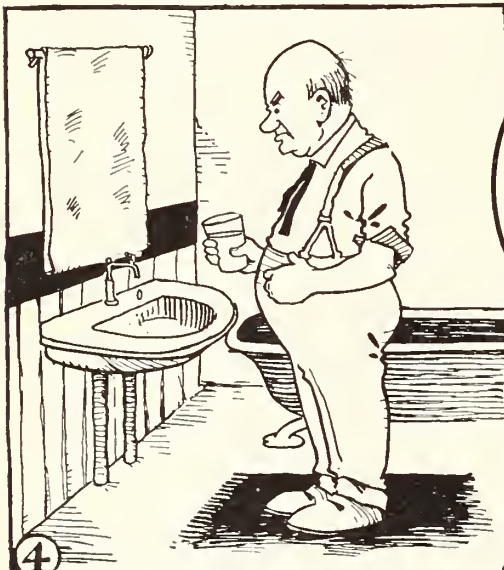
① SANITARY ENGINEER JONES GOES FOR A HOLIDAY TO A MUCH ADVERTISED RESORT IN THE COUNTRY



② FIRST IMPRESSIONS ARE FAVORABLE



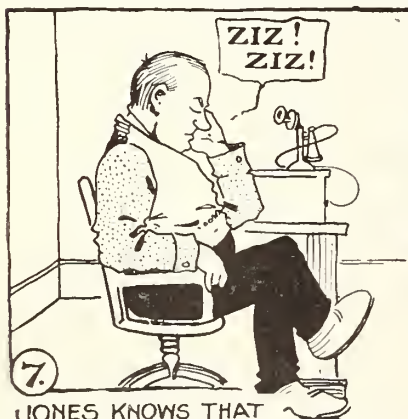
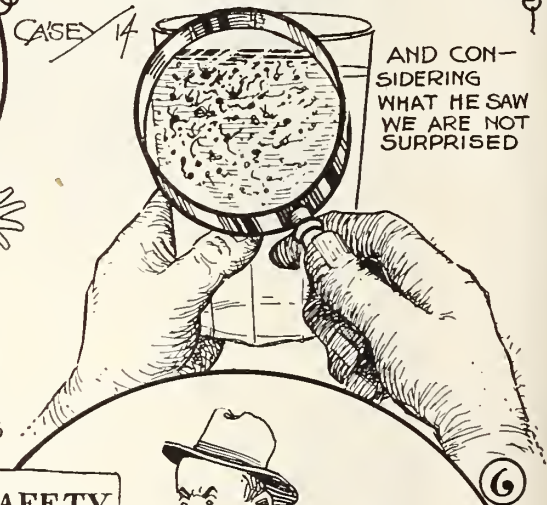
③ LATER ON HIS EQUILIBRIUM IS ALMOST UPSET BY A PEEP AT THE SANITARY CONDITIONS PREVAILING IN THE BACK PREMISES



④ AFTER IMBIBING SOME OF THE WATER, JONES NO LONGER WONDER WHY MOST OF THE PROFESSION DILUTE THEIR DRINKING WATER WITH—



⑤ HE ALL BUT COLLAPSES AS A RESULT OF A LITTLE ANALYSING STUNT



⑦ JONES KNOWS THAT THE "SAN. ENG. BUSINESS IN THE CITY JUST THEN IS DULL



⑧ WHEREAS AN UP TO DATE SAN. ENG. ESTABLISHMENT IN MOST HOLIDAY RESORTS COULD SCARCELY COPE WITH THE BUSINESS



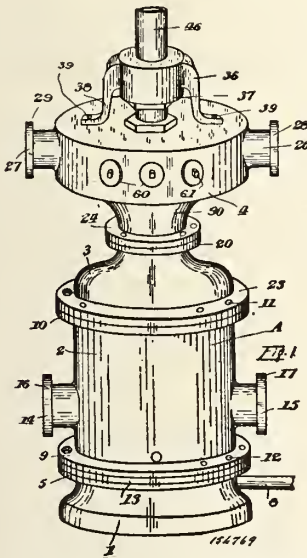
⑨ JONES BELIEVES HIS HEALTH IS ENDANGERED, AND HASTENS BACK TO THE CITY.

NEW CANADIAN PATENTS

No. 154,769.

William G. Edge, Ottawa, Ontario, Canada, 31st March, 1914; 6 years.
Filed 16th January, 1914. Receipt No. 133,520.

Claim.—1. A liquid heater comprising a base, an outlet pipe extending from the outer periphery thereof, a body part having inlet conduits extending from the outer periphery thereof, a tube plate extending across and located at the bottom of said body, a dome-shaped part, an upper casing having a concentric orifice through the top thereof, and outlet conduits extending from the outer periphery diametrically opposite the said inlet conduits, means of securing said casing, dome, body, tube plate and base together, a steam chest provided with a plurality of threaded orifices in the bottom face and a threaded concentrically located orifice in the top face, a plurality of pipes connecting the said steam chest and tube plate, a steam pipe engaging at its lower end with the said steam chest, the upper end of said pipe passing through the orifice in the said casing, and means of providing for the expansion of said steam pipe, steam chest and plurality of tapered pipes, as and for the purpose specified.



154,769. Liquid Heater.

trically located orifice in the top face, a plurality of pipes connecting the said steam chest and tube plate, a steam pipe engaging at its lower end with the threaded orifice, the upper end of said pipe passing through the orifice in said casing, and means of providing for the expansion of the said steam pipe, steam chest and plurality of pipes, as and for the purpose specified.

2. A liquid heater comprising a base having a sloping bottom extending across and located intermediate of the bottom and top edges thereof, an outlet pipe extending from the outer periphery of the said base and located at the lower side of the said sloping bottom, a body part having inlet conduits extending across and located at the bottom of said body, a dome-shaped part, an upper

easing having a concentric orifice through the top thereof and outlet conduits extending from the outer periphery diametrically opposite the said inlet conduits, means of securing said casing, dome, body, tube plate and base together, a steam chest provided with a plurality of threaded orifices in the bottom face, and a threaded concentrically located orifice in the top face, a plurality of pipes connecting the said steam chest and tube plate, a steam pipe engaging at its lower end with the threaded orifice, the upper end of said pipe passing through the orifice in the said casing, and means of providing for the expansion of said steam pipe, steam chest and plurality of tapered pipes, as and for the purpose specified.

3. A liquid heater comprising a base having a sloping bottom and an outlet pipe extending from the outer periphery thereof, a body part provided with inlet conduits of tube plate extending across and located at the bottom of said body part, an upper casing having a concentric orifice through the top thereof and outlet conduits, means of securing the said casing, dome, body, tube plate and base together, a steam chest provided with a plurality of threaded orifices in the bottom face, such orifices increasing in diameter as they approach the outer edge of said steam chest, and a threaded concentrically located orifice in the top face, a plurality of tapered pipes connecting the said chest and tube plate, a steam pipe engaging at its lower end with the said steam chest, the upper end of said pipe passing through the orifice in the said casing, and means for providing for the expansion of said steam pipe, steam chest and plurality of tapered pipes, as and for the purpose specified.

4. A liquid heater comprising a base having an outlet pipe extending therefrom, a body provided with inlet conduits, a tube plate, a dome-shaped part, an upper casing having outlet conduits and a stuffing box in the upper face thereof, means of securing said casing, dome, body, tube plate and base together, a steam chest, pipes connecting said steam chest and said tube plate, a steam pipe extending from the upper face of said steam chest, the upper end of said pipe passing through the said stuffing box, and means of providing for the expansion of said steam pipe, steam chest and plurality of pipes consisting of a bracket located on the top face of the casing comprising a body having arms extending therefrom, the said body being provided with a con-

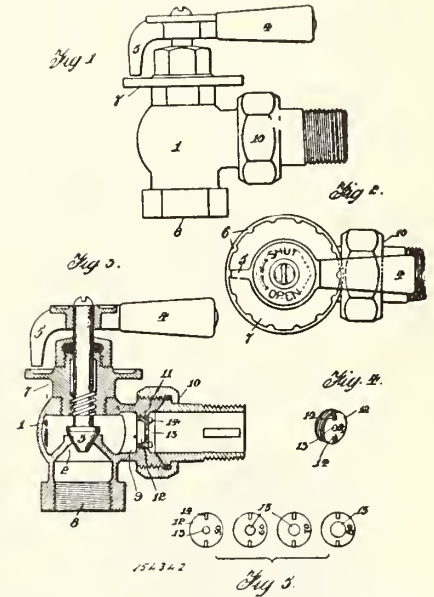
centrically located orifice or stuffing box in the bottom face thereof, a recess located above the said stuffing box, and stuffing glands engaging with the said stuffing boxes, as and for the purpose specified.

* * *

No. 154,342.

Eugene Solomon Manny, Montreal, Quebec, Canada, 10th March, 1914; 6 years. Filed 29th December, 1913. Receipt No. 232,856.

Claim.—1. In a steam supply valve for radiators, a casing having a valve seat therein, and a valve adapted to regulate the supply of steam through said seat, an inlet to said casing at one side of said valve seat, and an outlet on the other side, means for connecting said outlet



Steam Supply Valve for Radiators.

to a radiator, and a movable partition member across said outlet having a steam orifice therethrough.

2. In a steam supply valve for radiators, a casing having a valve seat therein, and a valve adapted to regulate the supply of steam through said valve seat, said casing having an inlet thereto at one side of said seat, and an outlet therefrom at the other side, means for connecting said outlet to the radiator, and a detachable bushing with a steam orifice therethrough and secured in said outlet to form a partition thereacross.

3. In a steam supply valve for radiators, a casing having a valve seat therein, and a valve adapted to regulate the supply of steam through said valve seat, and casing having an inlet thereto at one side of said seat, and an outlet

therefrom at the other side, said outlet having an internal thread and a bushing in the form of a disc with an internal thread fitting said outlet thread and a steam orifice therethrough.

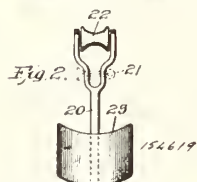
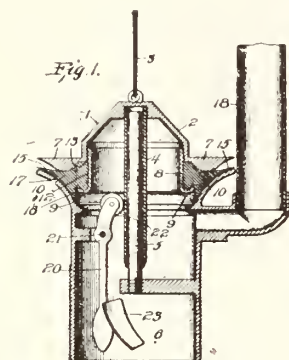
4. In a steam supply valve for radiators, a casing having a valve seat therein, and a valve adapted to regulate the supply of steam through said valve seat, said casing having an inlet thread at one side of said seat, and an outlet therefrom at the other side, said outlet having a thread, a removable bushing having a thread and filling said outlet except for a steam orifice through said bushing, the latter having also means whereby it may be gripped when screwing into said outlet, and also bearing a certain number or mark thereon for the purpose herein described and set forth.

* * *

No. 154,619

Edward L. Delaney, New York City, New York, U.S.A., 24th March, 1914; 6 years. Filed 23rd October, 1913. Receipt No. 230,328.

Claim.—1. In a flush tank valve, a two-part valve element, and a washer having a shoulder held between said parts and having a lateral portion extending outward between said valve parts and formed with substantially horizontal and depending pliable tapering extremities, said depending portion being spaced apart from said valve, in combination with a valve seat of formation corresponding to that of the extremities of said washer, whereby said



Flush Tank Valve.

horizontal portion of said washer is normally immersed, and said depending portion is immersed only when said valve is open.

2. In a flush tank valve, a two-part element having its outer surface curved upward and outward, and a flaring valve seat corresponding in formation to that

of said valve element, in combination with a washer held between said valve parts and having horizontal and depending portions corresponding in formation to said valve and said seat.

3. In a flush tank valve, the combination with the valve and valve seat, said valve having a lateral flange as 9, and a ring as 7, above said flange, of a washer having an inner portion as 12 held by and between said flange and said ring, and having an outward extending washer portion 15, and a depending washer portion 16, spaced apart from said flange 9.

* * *

No. 154,665.

Thomas Francis Payne, Pittsburgh, Pennsylvania, U.S.A., 24th March, 1914; 6 years. Filed October, 1913. Receipt No. 230,526.

Claim.—1. In a flushing apparatus, a normally empty tank, a casing having inlet and outlet ports and a passage-way leading to the tank, a valve for controlling the flow of water from the inlet to the tank and discharge outlet, a piston for controlling the valve, a relief valve for controlling the piston, and a third valve for controlling the flow of water from the inlet and tank to the outlet and adapted when moved to closed position to open the relief valve.

2. In flushing apparatus, a casing having inlet and outlet ports and a passage-way leading to a tank, a valve for controlling the flow of water from the inlet to the tank and outlet, a piston for controlling the valve, and having a barrel-like portion provided with a valve seat, a relief valve associated with the seat, a stem portion carried by the relief valve and depending from the first-named valve, means for normally holding the relief valve on its seat, and a third valve for controlling the flow of water from the inlet to the tank and outlet adapted to unseat the relief valve.

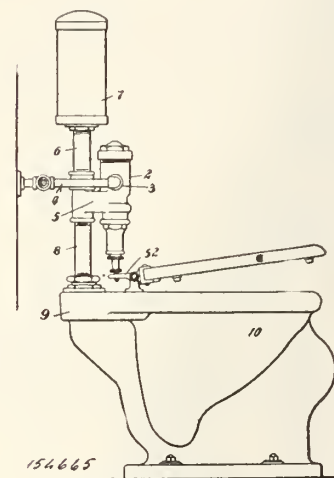
4. In a flushing apparatus, a casing having inlet and outlet ports and a passage-way leading to a tank, a valve for controlling the flow of water from the inlet to the tank and the outlet, a piston for controlling the valve and having a cylindrical chambered portion provided with a port, a relief valve controlling the port, a stem portion centered at its upper end in the piston and at its lower end in the first-named valve, and a third valve for controlling the flow of water from the inlet to the tank and outlet and adapted to unseat the relief valve.

4. In a flushing apparatus, a normally empty tank, a casing having inlet and outlet ports and a passage-way leading to the tank, a valve for controlling the flow of water from the inlet to the tank and outlet, a piston for controlling the valve, a relief valve for controlling the piston,

and a gate-like valve carried by the relief valve for retarding the flow of water from the tank to the outlet.

5. In a flushing apparatus, a normally empty tank, a casing having inlet and outlet ports and a passageway leading to the tank, means for so controlling the inlet port with respect to the tank

FIG. 1.



No. 154,665. Flushing Valve.

passageway and discharge outlet as to cause a flushing discharge of water to flow simultaneously from the inlet and tank to the outlet, and means for initially retarding the flow of water from the tank whereby at first a relatively large volume of water flows from the inlet and an increased amount flows from the tank as the flow diminishes at the inlet.

6. In flushing apparatus, a normally empty tank, a casing having inlet and outlet ports and a passageway leading to the tank, a valve for controlling the flow of water from the inlet to the tank and outlet in such manner that the flow from the inlet to the outlet shall gradually diminish, and means for so controlling the tank passageway with respect to the outlet that the volume of water passing to the outlet shall remain substantially constant during the flushing operation irrespective of the diminishing flow from the inlet.

7. In flushing apparatus, a normally empty tank, a casing having inlet and outlet ports and a passageway leading to the tank, a valve for controlling the flow of water from the inlet to the tank and outlet, a piston for controlling the valve, a relief valve for controlling the piston, a second valve for controlling the flow of water from the inlet and operate the relief valve, a depending stem portion carried by the last-named valve, and a pressure means for normally holding the second valve in open position.

Analysis of Can. Sanitary Engineering By-laws

Continuing the Above Series We Are Again Taking Up the Plumbing By-Law in Force in Fort William, Ontario Known as By-Law 1181 With Amendments.

IN our last issue we concluded clause 20. We will now take up clause 21, which defines the kind of material of which a fixture shall be composed, and before commenting in any way, we will reproduce it word for word.

Clause 21.

All fixtures shall be glazed earthenware, porcelain or enameled iron (lead or zinc lined sinks may be allowed in hotels or restaurants) supported on metal brackets or up-rights, and shall in no case be enclosed with wood.

In commenting upon this clause, we feel that it could be much plainer than it is; for instance, note the first part: "All fixtures shall be glazed earthenware, porcelain or enameled iron." One could infer that a common cast iron sink would not be allowed, neither would a galvanized one, or even a copper-lined one. Then in case of laundry tubs, slate, cement or other composition would not be allowed. We do not advocate that such discrimination should be made by any means. We do, however, think that such a clause is important enough to be more specific. No doubt plain east iron sinks should not be allowed; neither should any fixtures which are composed of materia which is in the least degree an absorbent. We do not think that hotels and restaurants should be excepted. There are more insanitary fixtures, such as galvanized, zinc, lead and copper-lined receptacles in such places than there is any need to be. Often the fixtures are made of 1½ in. lumber and jointed. Then after a time the lining becomes pierced, and water, grease and other foreign matter of an insanitary nature accumulates between the metal lining and the wood, thus making the fixture unfit for use. If, however, such fixtures are allowed, they should be inspected from time to time. The latter portion of this clause would almost infer that "lead or zinc-lined sinks" would not be allowed if encased in wood, because in actual fact all such fixtures are really encased in wood. We never saw any fixture made of anything else but wood, which was then lined with any of the aforesaid metals. Thus it is enclosed in wood, is it not?

Clause 22.

Traps off sinks, tubs, basins, etc., must have a brass cleaning screw in

an accessible position, and all traps must be back-vented.

The first part of this clause is general, as almost every trap made has a clean-out screw fitted to it. The latter part of this clause is, to say the least, arbitrary, and we feel sure it will be changed in the near future. We know that some time back it was felt by almost every member of the craft that "every trap should be back-vented." Now we have learned that such a clause will not doubt be modified somewhat, and is being done now by several large Canadian cities.

Clause 23

reads as follows:—

"Traps off fixtures to be placed as near thereto as possible, and all other traps to be placed in accessible positions. Grease traps of enameled iron, with air-tight covers, the water jacket, shall be connected to the cold water supply from the sink, so as to ensure effective working, and shall be installed on all sinks in hotels, restaurants, and such places as the inspector may direct. These traps shall be accessible at all reasonable times to the sanitary inspector.

This clause is about as good as can be. It is clear and specific, and one good feature is "That all sinks in hotels, etc., shall be fitted with a grease trap fitted to water supply," etc. Many a waste pipe and trap has been clogged up and cost many times the value of a grease trap, which could have been saved by the installing of the same. The writer knows of a cook who made all the common scouring soap from the kitchen grease taken from one of these traps, thus effecting a great saving. We should be only too pleased to see every city include such a clause in its by-laws at an early date.

Clause 24.

All pipes shall be placed so as to be easily traced and inspected and where necessarily enclosed, hinged doors or covers may be used.

Here is a clause which seems a very simple one, but it is one which should be recognized as more than simple. It means a great deal, and Sanitary Engineer would like to see it even more rigid. It should not only be able "to easily trace" such piping, but every householder should have a plan, not only

of the waste, but also all pipes which are in concealed places. Many a floor has been torn up and destroyed because it was not known exactly which way certain pipes were run, whereas if a plan of piping was supplied to each job such tearing up of floors would be a thing of the past except, of course, in case of a burst.

Not only so, but the craft would get experience in drawing plans, which experience they very much need.

Clause 25.

The vertical portion of the soil pipe must rest on a solid foundation of stone or concrete, and is not to be hung or fastened to any floor or wall. Horizontal runs of pipe to be either fixed to wall or hung from joists, with strong hold-fasts or stirrups made of "grabber bar" or heavy band iron, and placed at intervals of every eight feet.

Here is a clause which is of greater importance than many journeymen think.

The writer has seen some splendid jobs installed which have been spoiled because of the fact that too little importance has been attached to the matter of placing hangers or hold-fasts in the proper place.

Many an architect has demanded that "all holdfasts shall be placed at intervals of not more than 5 feet, and each holdfast must be placed close under the hub." Anyone who will give this matter a little thought will see that such a demand is ridiculous, because if the foundation of the building were to heave, either the screws in the holdfasts would have to give way or something else would have to go, the same if the stack settled, which, of course, is very seldom, except in cases where the work has been done in winter, and the ground on which the footing has been built has frozen hard. The proper place for a holdfast no doubt is not less than 6 inches below a hub.

A good foundation at the foot of every vertical stack is very essential, and we would like to see special base bends or fittings with a flat base cast on them used at the foot of every stack.

It is encouraging, to say the least, to note that the City of Fort William believe such a clause essential in their plumbing by-laws.

Display More Economic Confidence

Great Britain's declaration of war was not three weeks old when instances occurred of some of our largest firms closing down their plants, discharging their employees and thus accentuating the distress caused by the lack of employment which is to a certain extent an inevitable consequence of modern warfare.

It is true that certain industries whose work depends upon materials which can only be obtained from the belligerent countries will be hard put to it to continue at work, but in the majority of cases to which we refer this condition does not apply. On the contrary, the high seas have been declared open for commerce as usual, and therefore, in the great majority of cases, there is no difficulty either in obtaining raw material, or in disposing of the manufactured products. Why then this precipitate haste to cry "wolf?"

When thousands of our fellow-countrymen are risking their lives for the general welfare, it behooves every man in the position of employer to close down his productive plant only in the last extremity, and surely this last extremity can not have arrived within three weeks of the declaration of war!

It is to be feared that in many cases an undue regard is being paid to a probable diminution of profits or decrease of dividends. But if those responsible for the course of action referred to would consider the matter calmly for a few moments they would surely see, that even from a selfish point of view, it would be to their own interests to maintain their producing plant to as great an extent as possible, even though for the time being profits and dividends should go by the board.

All large organizations have buildings and plant which if not in use, are not only ceasing to make money, but are actually costing money in loss of interest on capital and in the inevitable depreciation of plant and machinery when such plant and machinery are lying idle and neglected.

Let the employer then make up his mind that if a loss is inevitable, such loss shall be accompanied by the least dislocation possible to the business of the country and the least inconvenience to the working portion of the community. What if the result be that for the time being, his stock of goods on hand be increased! Has he not confidence enough in his country to know that such congestion will be only temporary, and that busy times are as sure to come again as is the sun to continue in its course.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

How to Lay Tiles for Sewage System.

Editor Sanitary Engineer.—In your last issue of *The Sanitary Engineer* you published an article entitled "Septic Tank Installed Below Ordinary Level." Could you please inform me in your next issue how the tile pipes would require to be laid so as to allow the vent at the extreme end of the tile system to supply air, also how would the joints be made in the tile pipe?

An Interested Reader.

Replying to "An Interested Reader," we are showing in Fig. 1 a plan of piping, which is, of course, merely a suggestion. While we have shown Y branch tile pipes, a straight T could be used. The joints would not have to be made tight with anything, but simply place the hub and spigot as shown. Then the branches which are shown as leading to and from the hubbed pipe should be about a quarter of an inch apart, so as to allow the liquid to percolate through; the coke will prevent any earth from washing into these open joints, and the hubs will also protect the various joints on the drain pipe.—Editor.

Why Not Connect Bath and Lavatory Wastes to W.C. Lead Bend?

Editor Sanitary Engineer.—In your June 1st issue of the *Sanitary Engineer*, I beg to refer you to your answer to my inquiry regarding the connection of lead waste pipes from other fixtures into the lead bend. You have apparently misinterpreted my inquiry. I am desirous of knowing, not from a convenient but from a practical standpoint, why most plumbing by-laws prohibit this connection. You mention that it was this practice of connecting to the lead bend that necessitated the venting of other traps. I would take it from this, that where a separate fitting was placed in the stack for bath and basin wastes, that the traps from these fixtures would not require back-venting. You also say that the expansion and contraction of the lead pipe when hot water is let into it is liable to break the joint. If this is the case, would the same danger not prevail where the bath and basin wastes are connected together before they enter a separate fitting, or where any lead pipe is wiped into another piece of lead

pipe or brass ferrule? Is the joint not stronger than the lead itself? Or is there any material used in the ordinary plumbing job that expands and contracts less than lead or will stand expansion and contraction better? I trust I have now made my enquiry clearer.

S. J. C.

Again taking up this matter in reply to S. J. C., we will try to be a little more clear. Re the question "why most plumbing by-laws prohibit the connecting of waste from lavatory or bath into the w.c. lead bend", we referred this question to Wm. Meadows, the chief inspector of the plumbing department in Toronto and he replied as follows:—

"There are several reasons why, from a practical standpoint this should not be allowed. There is not enough depth in joists to allow of sufficient grade to prevent waste of w.c. being forced into bath trap. When hot water is discharged through the bath trap, it heats all the lead bend and brass ferrule, causing these to expand, and when w.c. is flushed it cools off so quick-

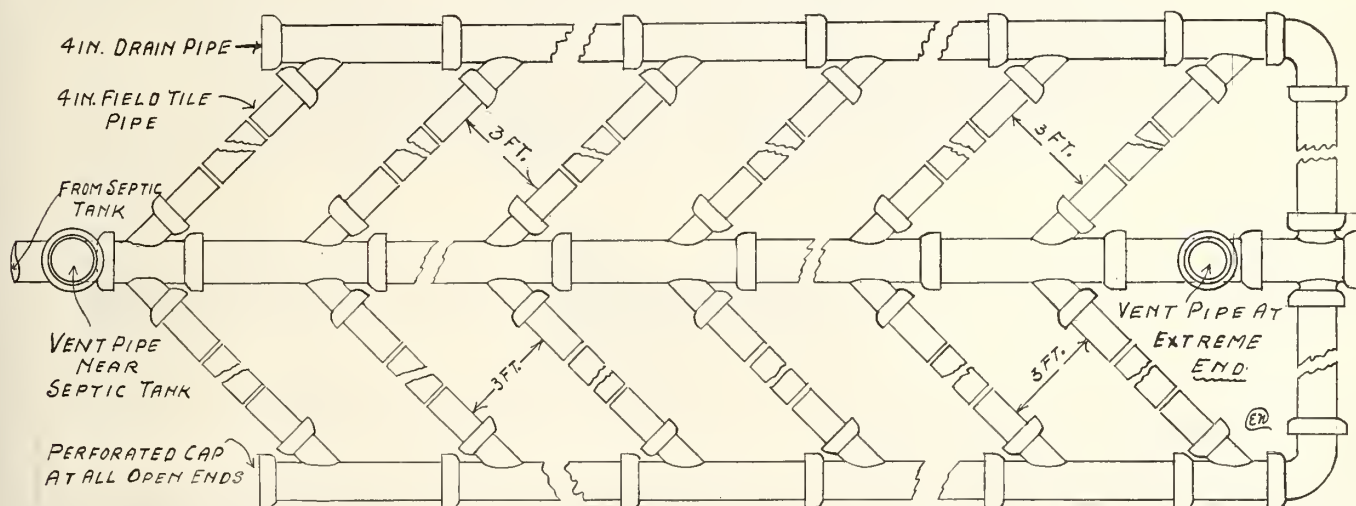


Figure 1.

ly that the contraction of the different metals causes the 4-inch joint to crack."

Referring to our correspondent's query that "if the wastes from bath and lavatory are directly and separately connected into the stack the traps under these fixtures would not need to be vented," we may state that, there are other circumstances which would render such venting necessary, for instance, if the bath or lavatory were an extra long distance from the soil pipe, the traps would require to be vented, but in an ordinary bathroom of say 6 x 10 or so, neither of these fixtures would require venting, particularly if deep seal traps were used. Referring to the danger of expansion breaking the lead pipe when hot water is run through them, it is not the lead pipes which would actually break except at a point where there is a brass ferrule. The unequal expansion and contraction of these two metals, is bound to fracture the joint, and the heavier the wiped joint, the greater the possibility of a fracture.—Editor.

* * *

How Can a Garage be Heated With Hot Water?

Editor Sanitary Engineer.—Several of my customers have made inquiries as to how they can heat their garage by hot water. They asked if it would be possible to heat a large enough radiator from the furnace to keep the water in the automobile radiator from freezing, as well as keeping the car warm. It is often necessary to do some repairing and cleaning in the garage where owing to lack of heating it is very uncomfortable.

A. R. R.

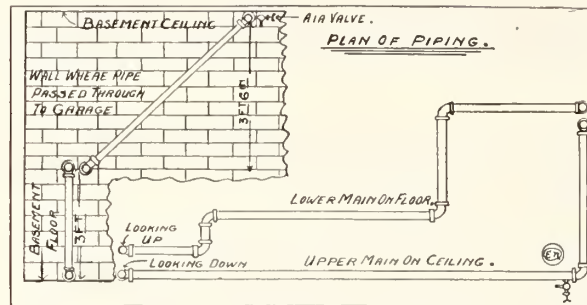
Replying to A. R. R., we may state that there are quite a number of methods which can be adopted in heating a garage with hot water.

If the various levels permit, the gar-

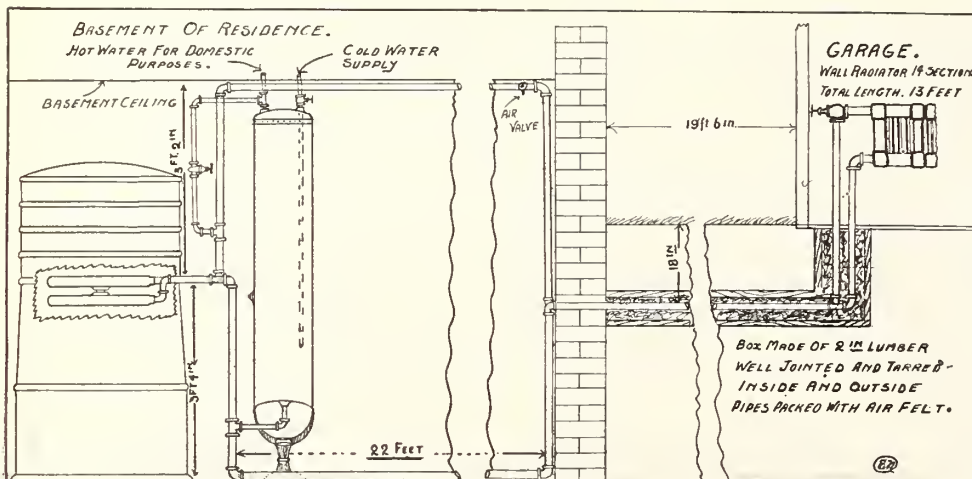
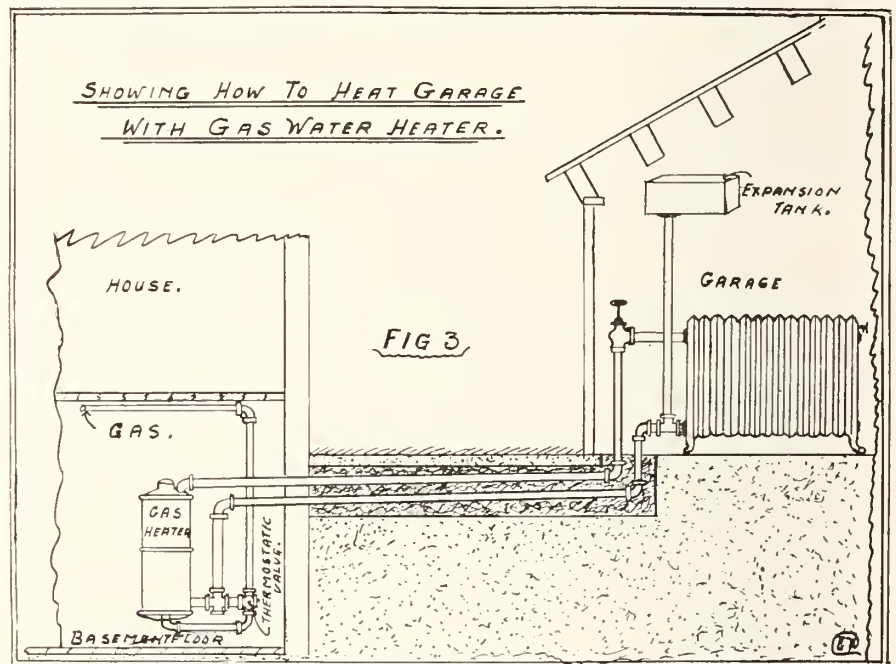
age radiator can be connected up to the hot water furnace in the usual way. It must, however, have a pair of mains of its own because of it having to heat a colder place than any other portion of the house. The mains must also be well protected from both moisture and cold and not less than two inches in ten feet of a rise to and fall from the furnace, as few elbows as possible must be used. On the other hand if the levels are such as to make it impossible to connect radiator

to the furnace, it would be possible to insert a cast iron heater in the furnace fire box as shown in Figs. 1 and 2. This job was installed as shown last fall and worked splendidly in spite of the fact that the winter was exceptionally cold.

Fig. 3 also shows how a garage may be heated by the use of a gas water heater. The heater is connected up as shown and is fitted with a thermostatic controlling valve. So that an even temperature can be maintained.—Editor.



Showing position of piping and fittings used and the wall plan of piping where it ran through wall underground to garage.



Showing how hot water heating system was installed in a residence to heat a garage; two 12-in. Bigley heaters were connected together by a one-inch nipple and piping connected to range boiler as shown. This system gave splendid satisfaction last winter.

Here are three questions, Mr. Plumber, which should interest you at the present time :

1st. *Who* is going to benefit most by the present high prices of foodstuffs and the exceptionally low values of manufactured articles?

2nd. *Who* will have the most capital at his disposal for building purposes?

3rd. *Where*, Mr. Plumber, is your best field for new work?

In our opinion, the lucky man who is the answer to all three questions is the *farmer*, and now is the time to strike him.

There is no reason why he should not have all the modern conveniences of the city home at his disposal and it is up to you, Mr. Plumber, to prove it to him.

We have a large number of different pressure and open tank systems suitable for country homes and are positive that we have an outfit to suit every particular requirement. Go after your man, and write us for prices.



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Practical Problems for Sheet Metal Workers

How to Develop 45 Degree Branch Piece

By E. Bronson.

Editor Sanitary Engineer.—I am enclosing a rough sketch of a pipe junction and taper pipe. Finding that you have a very good way of teaching, and am much interested in sheet metal, therefore if you would kindly place my pattern in your next issue, if possible, you will render me a great service, also state if the same method would be adopted in developing a branch piece at any angle.

D. M. L., Quebec County.

Replying to D. M. L. we may state that on account of space we will only show how to develop the junction or branch piece in this issue, the same method is adopted, whatever angle it may be, the first step in pattern development, is, to draw an elevation as shown at A and B. Then draw all lines as shown till they intersect at the various points. It will be seen that the plan D is actually acquired by drawing dotted lines downward. We will show how to develop the taper piece in our next issue.—Editor.

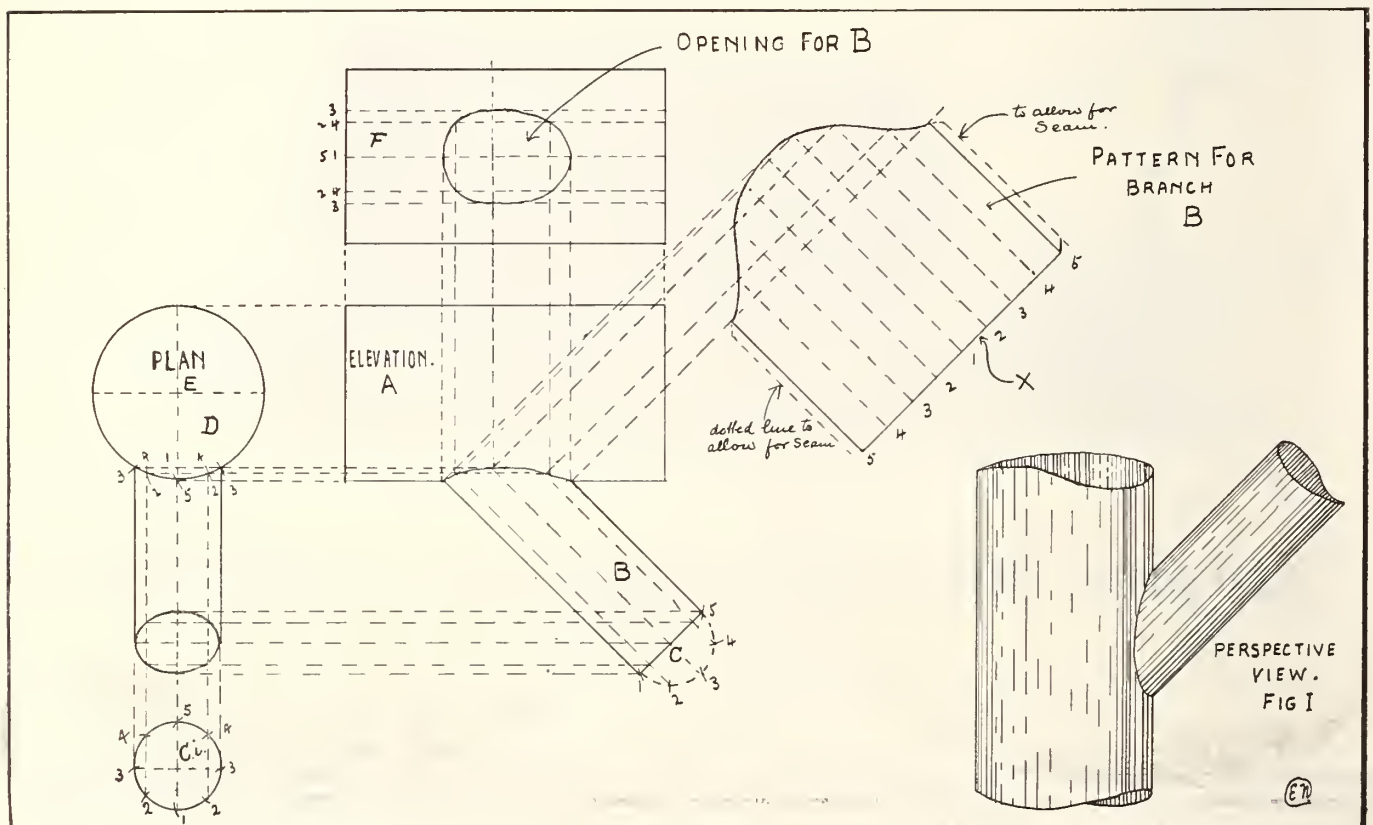
Having drawn the elevation, determine the centres of A and B; then form half-circle C on the branch and full circle on, as shown in plan D. Next

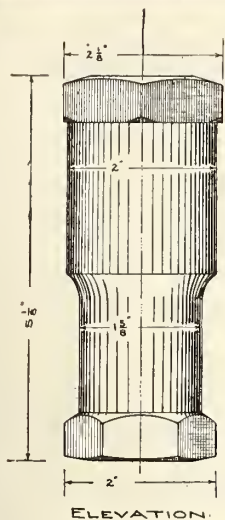
place compass at E in plan and transfer the diameter of branch, and in that way determine full plan of both the main cylinder and branch. Next erect the centre line, as shown, and form small dotted circle. Next divide C' in equal parts, as shown, transferring same measurements to half-circle C, shown on branch B. Next draw dotted lines, shown at C', 1, 2, 3, 4, 5, 4, 3, 2 upwards until same intersects the circle D, and repeat the operation at C, 1, 2, 3, 4, 5 on the branch B. Next draw lines, as shown, from where dotted lines intersect plan to where they will intersect the dotted lines drawn at C, 1, 2, 3, 4, 5.

The next step will be to draw a section of elevation where the pattern of opening may be developed. This is done by extending lines upwards, as shown at F, and it may be stated this opening may be drawn on a small piece of material and afterwards scribed out on the larger sheet, which would be used on the actual job. Next transfer the measurements from C, to section F, beginning with the centre measurements 5, 1, until all have been transferred; then

extend these measurements, as shown across section F. Now erect dotted lines upward from elevation at points where dotted lines from plan D and branch B intersect, and in doing so another set of intersections are formed in F, and at points where these lines intersect is shown the pattern of opening, as described.

Our next step will be to develop pattern of branch. This is done in exactly the same way as a square elbow pattern is developed, except that the points of intersections are used which has been formed by the various intersected dotted lines from plan D, branch B, and vertical lines to section F. Next draw a solid line, as shown in pattern at X, and stretch out measurements from half-circle C on B, beginning at 5, 4, 3, 2, 1, and 2, 3, 4, 4, as shown. It will be seen points 5, 5 are the shortest measurements and point 1 the longest. Next erect dotted lines from the stretch-out X upwards until they intersect the dotted lines last drawn. Then by connecting the various points intersected the pattern the branch is completed.





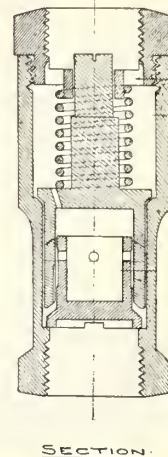
MAKES HOT WATER JOBS BETTER THAN STEAM

Our Knickerbocker Automatic Regulator for Hot Water Systems shown here is designed especially to overcome the one great objection to hot water heating, namely, low temperature of the radiation.

It does other things too. Among them may be mentioned: the ending of all trouble with old systems having sluggish circulation; reduces sizes of radiation and pipes on new jobs, saving up to 25% of the radiation; makes a hot water system equal to low pressure steam for flexibility, and better, by far, in the matter of temperature regulation. Any temperature up to 250° Fah. may be obtained.

If you want to know more about our Knickerbocker Regulator ask us for a circular. List price \$15.00. Liberal discount to the trade. Ask for our catalogue of Brass Goods for Plumbers and Steamfitters at the same time.

The James Morrison Brass Mfg. Co., Limited
93-97 Adelaide St. W., TORONTO, Can.



Our Mixed Metal Sales Amount to Over \$5,000,000 Annually



THE RESULT OF QUALITY

Babbitt Metal, Bar Solder, Wiping Solder, Wire Solder, Lead Pipe, Bar Lead, Traps, Bends, Copper, Tin and Antimony.

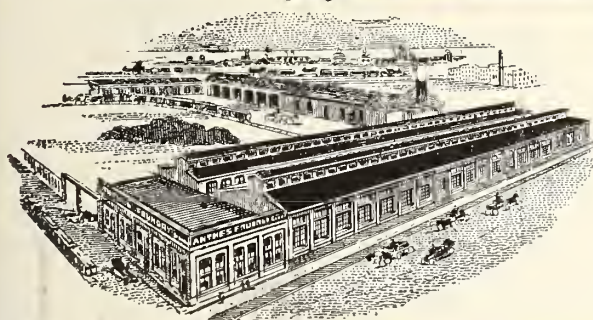
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Toronto, Ont.

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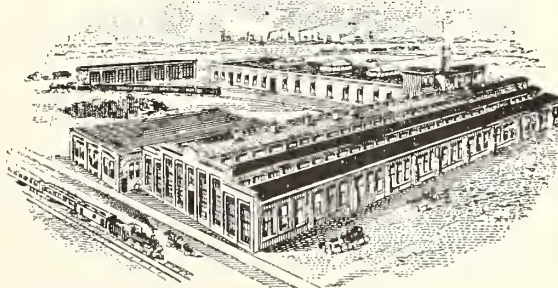
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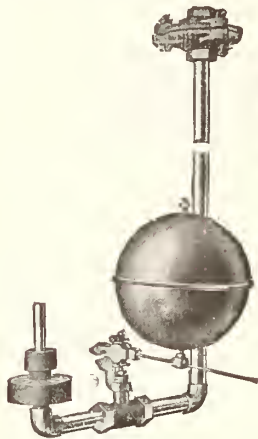
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CAST IRON
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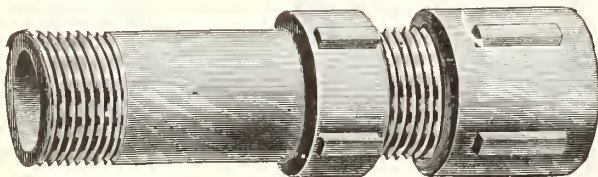


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TRULY, it is an ill-wind that blows nobody good. One Continent's "down" is another Continent's "up." The industries of Europe are, generally speaking, at a standstill, and matters will be worse before they can be better.

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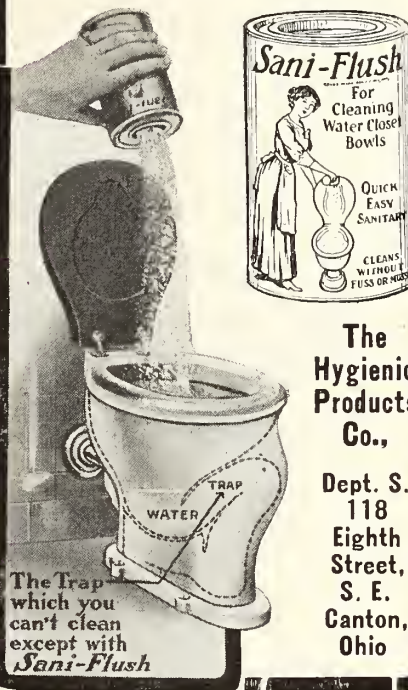
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Its remarkable benefits have been advertised extensively in the leading women's journals, and your customers know of it and will use it in their homes. Will you supply them with the only practical closet-bowl cleanser that does its work well, removing encrustation from the seen and unseen parts of the trap? Sells at 30c. Write for prices and terms.



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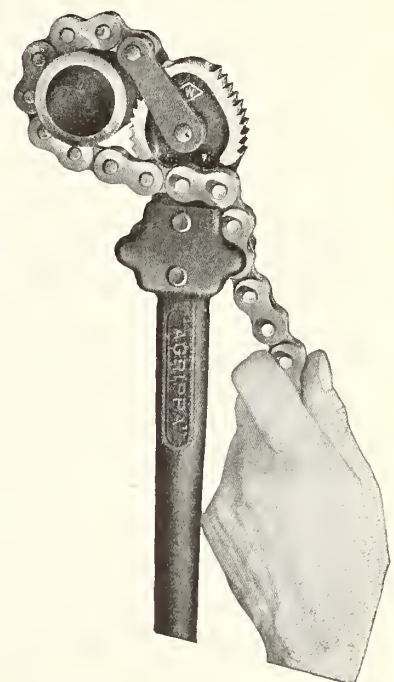
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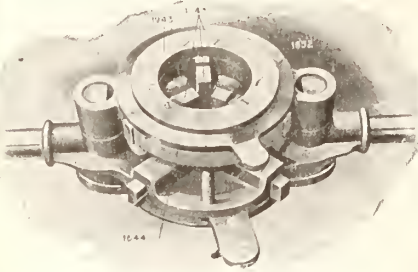
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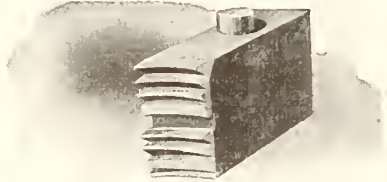
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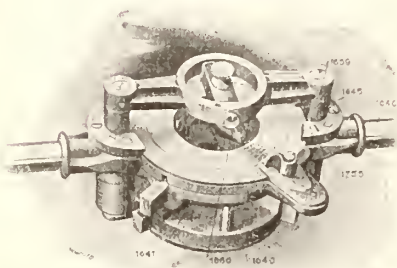
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The General Machinery Co., Ltd., Toronto.



Rear View of Die Stock



Two Dies in One



Die Stock Open

Prod Up Old Father Time

Eliminate waste of movement, waste of time,
waste of energy, by using only the efficient

PREMIER DIE STOCKS

There's no more worry over lost or "left behind" bushings, dies, etc.; no more trouble with screws and nuts; no more going over the thread twice to cut a "Briggs" standard thread; no more backing off, which spoils the dies. All this is left behind when the "Premier" is used. Note the features of the Premier Die Stock:

- threads pipe 1 to 2-inch right and 1 to 2-inch left with one set of dies.
- the new patented Off-Set Die, which can be used only in the Premier, has overcome the difficulties with leader screws and nuts.
- die made in such a way that once over pipe is sufficient. Will cut

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—has but one lock, and that is used when changing from one size to another. The centering device has a scroll cam, without locks, which operates the three jaws that guide the die stock on pipe.

—works so easily that a novice can operate it. It not only starts itself on the pipe, but automatically throws itself out after thread is cut.

Full particulars sent on request.

Why not drop a line now?

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MUELLER Reducing and Regulating Valves

Cover every phase of pressure reduction. There is no other line so complete, and no regulators which will give you such perfect service.

They are Unconditionally Guaranteed. Clip and Mail the Coupon.

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H. Mueller Mfg. Co., Ltd.

SARNIA, ONTARIO

Makers of High-Grade Plumbing, Water and Gas Brass Goods

The Best
all-around
Regulator Made.



D-13160

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H. MUELLER
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Send me your No. 5
Regulator Catalogue.

Signed

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at the Joint
No Deterioration

Dart Unions

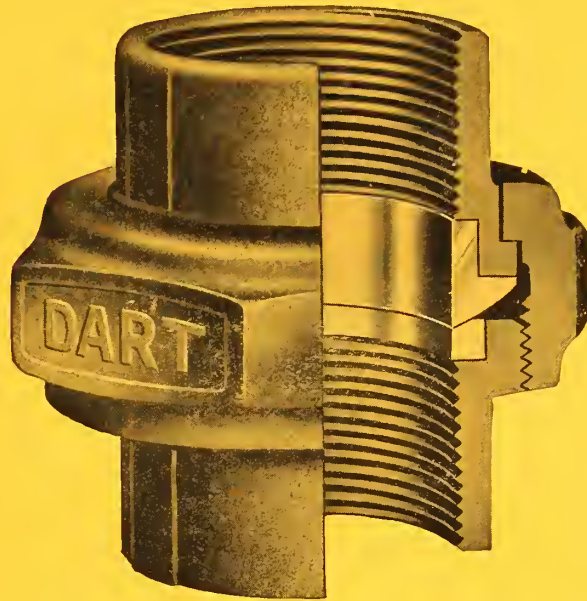
are easily and quickly connected, whether pipes are in or out of alignment.

They assure satisfied customers, because they never leak unless deliberately loosened with a wrench.

Every DART bears our trade-mark (your guarantee). Any defective dart will be replaced 2 for 1.

*Sold by Jobbers Throughout
Canada.*

Manufactured by
Dart Union Co., Ltd., Toronto



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(“New KEYSTONE” Pattern) GATE VALVES



If you have not used any of these New Pattern Valves, specify “KERR” in your next order. We want you to get acquainted with the most reliable valve on the market.



If you have been using them, we are confident that our satisfaction will bring us your repeat orders. These valves will never cause you or your customer the slightest trouble. Their high quality is consistent.



When you buy a “KERR” Valve you get a guaranteed article that is backed by a reliable firm. Many of the largest distributors of valves in Canada have sold “KERR” Valves for over 25 years, and are still recommending them as the “Best Valve.” Write us for particulars.

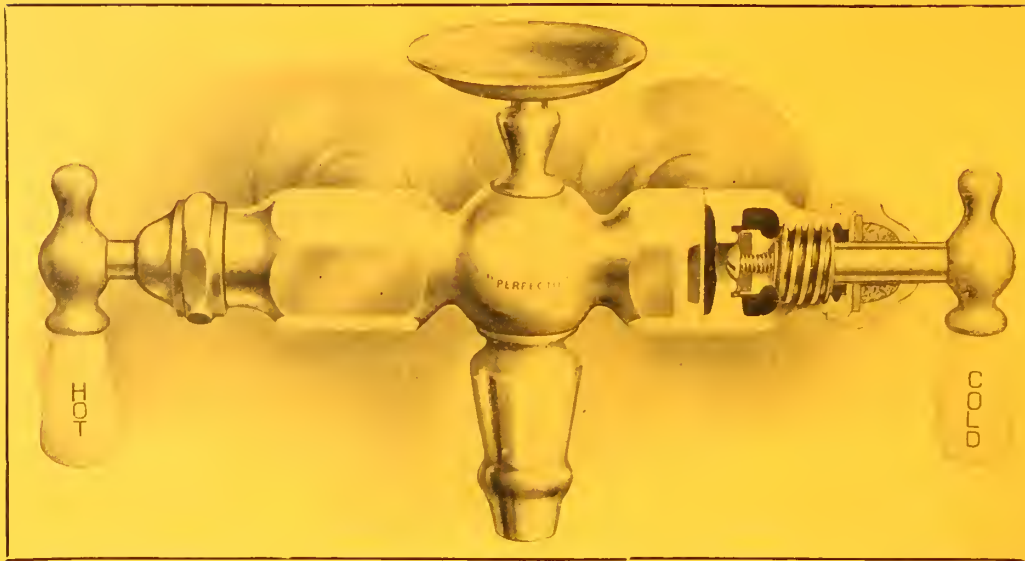
Kerr Engine Co., Ltd.,

Valve Specialists

Walkerville, Ont.

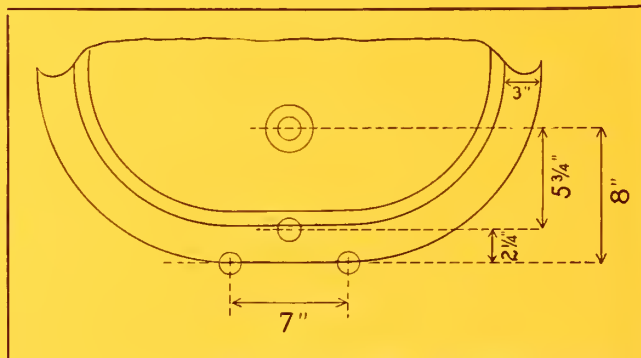
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GALT BRASS

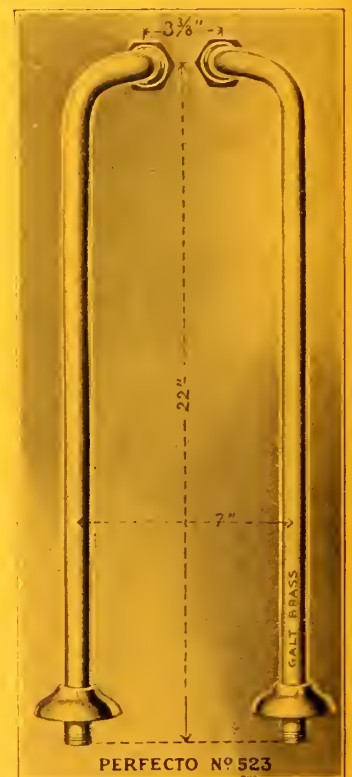


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Use The "Perfecto" when in a hurry—
Saves half the time and all the worry.



"ROUGHING IN"



THE
"PERFECTO"

BATH COCK is a modern achievement in the quick-pressure or rapid-opening type, giving you lever action, and largest waterway made, coupled with a very attractive design.

COMBINATION WASTE AND OVERFLOW—Heavy cast parts, being adjustable, you have no tubes to cut, making it a great time saver.

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"ROUGHING IN" will, we trust, be of convenience to you. (All our other styles rough in the same as the "Perfecto.")

GUARANTEE—Same as we extend on all goods bearing our name.

SEND US YOUR ORDER NOW.

GALT, CANADA

BATH SET

THE SANITARY ENGINEER PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

Publication Office : TORONTO, SEPT. 15, 1914

No. 18

Extracts from several of the letters received about OUR REVISED PRICE BOOK

"We acknowledge with thanks your new price book and trust your advice will be the means of many considering the cost when they wish to sell at a profit, as we are satisfied many do not consider selling expenses."

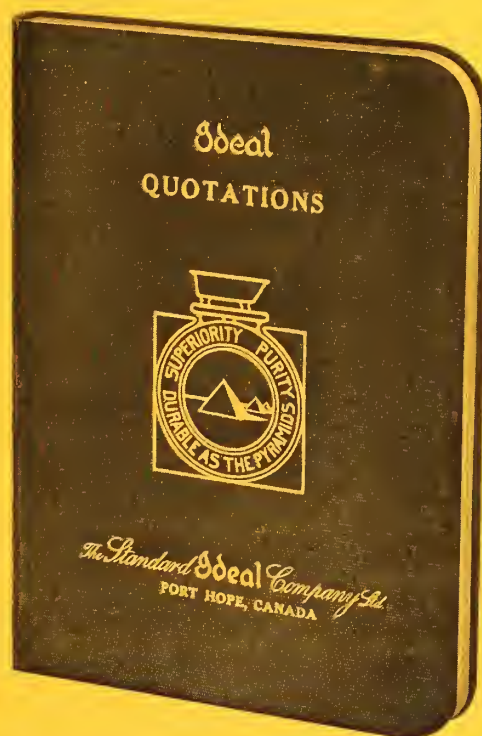
"It will be of service to me in my office and I wish to thank you for same."

"It is a very handy book and will be of much benefit to us."

"There is no doubt that these are a great convenience to the ordinary Plumber, by having both the cut and price on the same page."

"It is pleasing to know that the manufacturer is taking an interest in the welfare of the trade. There has been a vast difference in prices at the various shops in this city."

"It is a source of great pleasure that I have read your circular letter in reference to your new price list, and I assure you that you will get the wholesale praise of the Plumbers in your great help to them. No doubt, it has been a great deal of work for your firm, but the multitudes will reap the benefit and you reap the pleasure of a lot of satisfied and pleased customers."



"I received your new price book. I have not had time to go into it thoroughly, but notice in looking it over that it is a complete book. I read with interest your circular letter and must say you have taken a step in the right direction in protecting the trade with a retail price list. Kindly accept my thanks for compiling such a valuable price list."

Loose-leaf—actual size, 5x7"—fits the pocket.
CONTAINS CONSUMERS' PRICES.

Mailed to all Jobbers, Salesmen, Plumbers and Architects
[except Western Architects and Plumbers]

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A copy will be mailed to you upon receipt of your request on your Business Letterhead

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

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MONTREAL
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WINNIPEG
76-82 Lombard St.

VANCOUVER
410 Carter Cotton Bldg.

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Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.

These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

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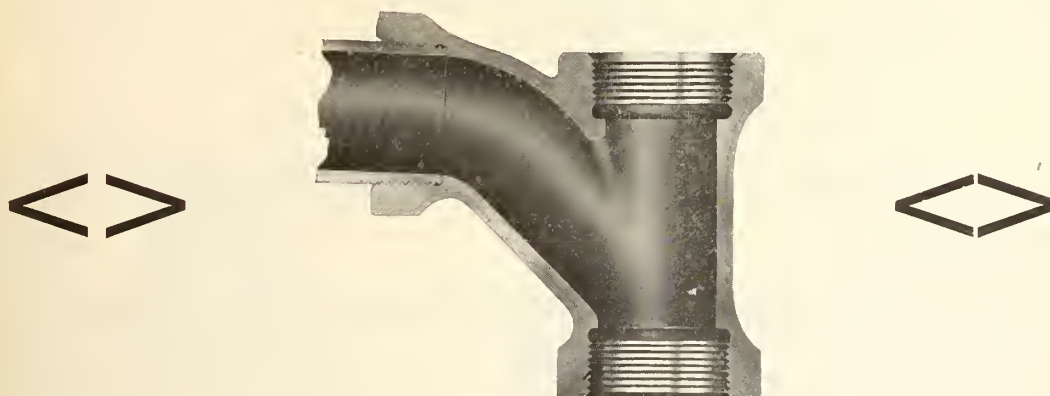
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Over 55,000 DAISY Boilers

are giving the best of service throughout Canada.

The Daisy has qualities which make it a better proposition than any other on the market.



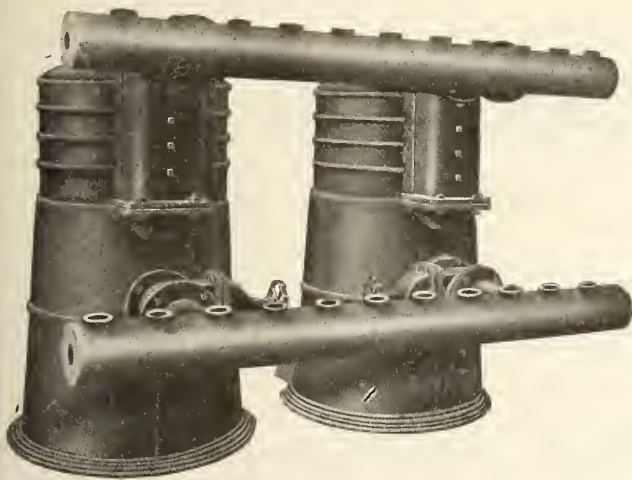
Made in the best equipped plant in Canada.

Without doubt the most popular boiler made.

Every installation means another customer satisfied.

Minimum consumption of fuel.

Maximum amount of heat.



Rear view of two Daisy Boilers connected with twin headers. This system gives great satisfaction in mild and extreme weather.

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IRON BODY GLOBE, ANGLE and CHECK VALVES

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JENKINS BROS. LIMITED

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FIG. 141

Standard Pattern,
Iron Body Globe Valve
Screwed with Yoke

Something for Nothing

Our booklet full of useful information, blue print and full particulars of our courses in Plumbing, Sanitary Science and Engineering, Hygiene, etc., for plumbers and those wishing to become Engineers and Inspectors FREE.

Just Risk One Cent

and get this information free from Professor Arthur Bateman, who has been the head of four different institutions in two countries for eleven years.

Write this very minute to

The Anglo-American Sanitary Correspondence College

Desk 2, 10-12 W. Ontario St., CHICAGO, ILL.

and

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300,000 lbs.

carried in stock for immediate
shipment of

Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

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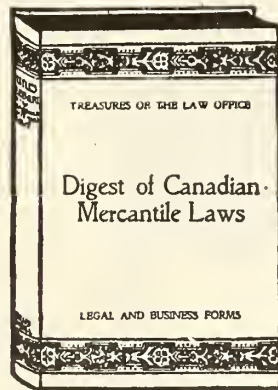
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HAMILTON, ONT.

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"Digest of the Mercantile Laws of Canada"

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No work ever published in Canada equals it for business men. A veritable consulting library on this one line so universally needed. Based on Dominion and Provincial Statutes and Court Decisions. Indorsed by barristers, sheriffs, magistrates and conveyancers.

Below appears a few of the questions it answers. These are picked out at random from the book.

If you endorse a cheque which bank cashes, are you liable to the bank for the amount, if the cheque were forged or raised?—173.

(The figures after each question refer to the section in the "Digest" which gives the answer.)

Can interest written "one per cent. per month" in a note be collected by "legal process"?—See sections 345, 185.

In going security on a note, what is the difference between writing your name on the face of the paper or on the back?—171.

Why is it that a verbal agreement to buy real estate with, say \$100 paid down "to bind the bargain," does not bind either seller or buyer?—451.

If a proposition is made to you by letter and you accept it by letter, do you know the exact time when the contract is closed?—39.

How many years does it take a promissory note, a book account, a judgment or a legacy to outlaw in your province?—356, 359, 360, 367.

How long may the drawee legally hold a draft for acceptance?—209.

If a man, in the presence of a witness, makes a verbal agreement to buy a wagon, say for \$50, but does not take possession of it, will the sale be binding?—500.

What effect has it on a will if only one person signs it as a witness?—815.

If the wife or husband of a legatee signs the will as a witness, what is the effect?—816.

"A," in paying off a mortgage, gave mortgagee a marked cheque on which was written: "This cheque is given and received as a full settlement and discharge of Mortgage No.——." Is that a legal discharge?—410.

If a person goes with his hired man to a merchant and says: "Give this man the goods he may need up to," say "\$15, and if he does not pay you," say, "within thirty days, I will," will the promise bind him?—110.

If stolen goods are sold to an innocent purchaser for value, can they be taken from him?—513.

How may a person legally add "& Co." to his name, or use any special name other than his own as a firm name, without having a partner?—694.

"B" claims that the Canadian Bills of Ex. Act allows him two days, in addition to the day of presentment, to accept a sight draft, and then three days of grace in which to pay it—six days in all. Is he right?—209, 217.

If you rent a property for a year, the rent payable monthly, and remain on after the year expires, are you a yearly or a monthly tenant?—580, 608.

Can you garnishee a debtor's money deposited in a bank if you know it is there?—885, 295.

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Keep the book ten days, and if it is not worth the price, return it and get your money back. If remitting by cheque make same payable at par, Toronto. Eastern Edition, Price, \$2.00. Special Western Edition, \$2.50.

To meet the needs of subscribers in New Ontario and the Western Provinces, where land is under the Land Titles System of Registration, an Appendix of 16 pages, containing a synopsis of the Land Titles Acts, has been added to our regular edition, thus constituting a special "Western Edition." Price, \$2.50.

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TORONTO

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Fuller Pattern—China Index Handles



As easy to operate as a regular Fuller.

Note:—Beauty of design and construction.

The handsomest and best bath cock on the market.

Furnished with brass handles also if so specified.

Made in Canada.

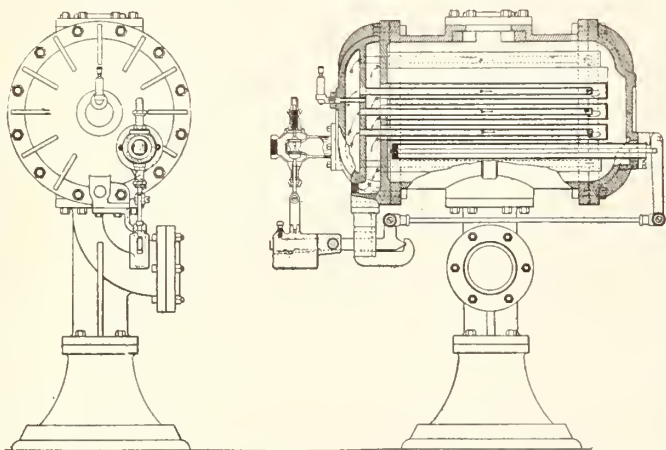
Price Reasonable.
Nough Said.

Manufactured by

Canadian Wolverine Company, Limited
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The "Manny" Heater

Affords Every Aggressive Steamfitter An Excellent Opportunity to Make Large Profits



The Manny Heater is connected to a hot water system as the ordinary hot water furnace, and steam is carried to it from a boiler house stationed outside the main building, at regular boiler pressure, but reduced at every heater by a steam pressure reducing valve to 20-15-10-5 lbs., or as low as one pound to the square inch, according to temperature required in the building. The steam is carried to the Manny Heater from the boiler room through underground pipes. There isn't a better or more economical way of heating large buildings. Many furnaces can be eliminated and much space saved. Supplied with or without Thermostats. Notice how provision is made for the expansion and contraction of tubes—Threaded Joints.

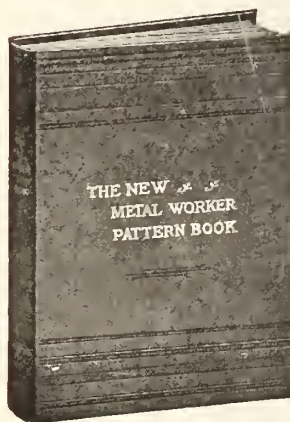
Let us give you full particulars, regarding this newest and best method of heating. Write for descriptive catalog F.

The E. S. Manny Co., Montreal

The New Metal Worker Pattern Book

This is the most elaborate and complete work that has ever been brought out for the use of sheet metal pattern cutters. It is printed from new type with a new and improved arrangement, especially

convenient for reference and study. Parts of a former edition, entitled The Metal Worker Pattern Book, which have been utilized in its preparation, have been re-written and simplified and later methods embodied. 218 problems are now given, 75 of which are entirely new. A Treatise on Pattern Cutting as applied to all Branches of Sheet Metal Work. By George W. Kittredge. 430 Pages; 744 illustrations; Size, 10 x 13 inches. Cloth bound.



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Technical Book Department

MacLean Publishing Co., Ltd.

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Be Prepared!

IN time of war prepare for peace!

¶ Keep your trade routes open. Maintain the prestige of your name and the supremacy of your line. Fortify against aggressive competition. Keep your organization on a war footing. Safeguard your connection.

¶ Be alert. Be optimistic. Be impervious to panic. Advertise!

¶ If we may believe authorities who have expressed themselves on the subject, if we may rely on our own deductions, or if we may consider precedents, then we may safely predict that Canada will not materially suffer, but eventually benefit as a result of the present war. So much for the future.

¶ From many quarters we hear reassuring news about the outlook for the **immediate** future. The prospect is anything but black.

¶ Faith and not fear, work and not worry, preparedness and persistence, not perfunctory pessimism, is the attitude to adopt and follow.

¶ Now is the time to strengthen your connection, to hammer home your sales message, to lay the foundation for future as well as present business. Now is the time to advertise.

¶ Rothschild, remember, laid the foundation for his immense fortune when the world was at war with Napoleon.

Messrs.
BRUNNER, MOND
& Co., ENGLAND,
Have the finest Industrial Bath Installation in Europe.

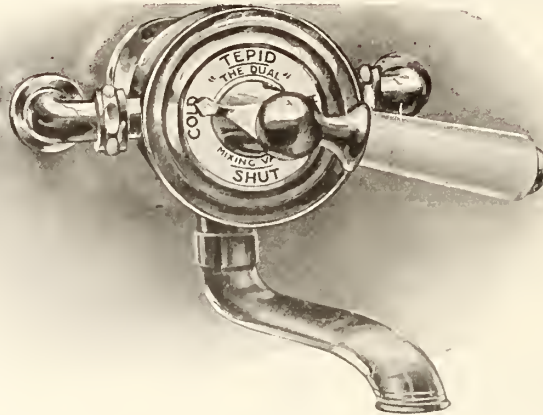
**OVER 2000
EMPLOYEES**

are provided for.

This is the Valve
used.

Made in England
by GUMMERS Ltd.,
ROTHERHAM

**THE DUAL VALVE
IS THE FINEST MIXER YET PRODUCED**



This Mixer is strong
and well built.

It can be taken to
pieces without disturbing
connections. Made in
various types for Baths,
Lavatories, etc.; also
special stock pattern
with one or two outlets
at option for making
up sets.

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Geo. Carpenter,
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WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



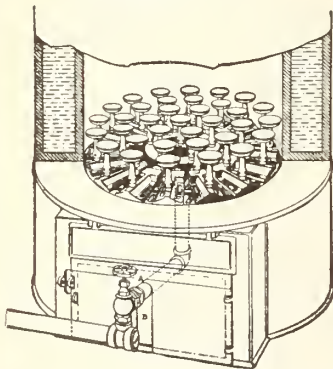
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CANADIAN TUBE & IRON CO., LIMITED

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Works: Lachine Canal

In a Round Boiler.



"Standard" Gas Saving Burners

Every Plumber or Gas Fitter is interested in applying the **Right Burner** to the heater used for warming—that is: the Steam or Hot Water or Hot Air Furnace whether it be in the house, the church, store, school building, or other buildings.

The "Standard" Gas Saving Burner is the **Right Burner** for this service. "Standard" Burners produce the largest amount of heat for consumption of gas. Instructions for installing furnished with each burner.

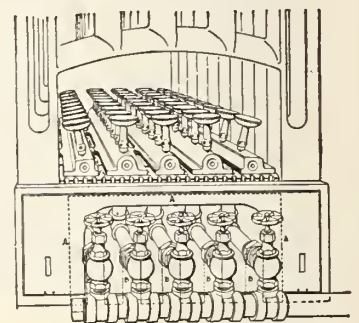
More than ten years manufacturing the "Standard" Burner—many in use.

Standard Heating & Radiator Co.

Manufacturers

Write for Catalogue Pittsburgh, Pa., U.S.A.

In a Square Boiler.



TWO CENTS PER WORD

You can talk across the continent for two cents per word with a WANT AD. in this paper

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We hear much to-day about "efficiency" in business. In a nut-shell, "Efficiency" means the most work—well done—in the least time—at the lowest cost.

In your filing department this calls for the use of NICHOLSON-MADE-FILES.

A half-century's use—at a present rate of 50,000,000 each year—is positive proof that these famous files cut deepest—work fastest—last longest—and cost least to use.

And by using two NICHOLSON-MADE-FILES where you now use one, you can cut down your filing cost to the absolute minimum, while adding materially to both the quantity and quality of the work.

Make NICHOLSON BRANDS the File-Standard in your work. See that no file is used after it becomes half-worn. The economies you effect by this method reveal undreamed-of extra profits in your filing department.

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BUSINESS

OVER
50,000,000
FILES
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Our
"Little Gem"
Automatic Air Valve

is equal to any radiator valve on the market and is sold at a very reasonable price.

Our Radiator Foot Rail

can be attached in a very few minutes to any standard radiator without special hooks or expert advice.

WE ALSO MAKE THE LINES SHOWN ON CUT.

The BEATON & CADWELL MANUFACTURING CO.
New Britain, Conn.

Eastern Agent: J. R. Devereux, 142 St. Joseph Boulevard West, Montreal.
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Gas Companies and the Public demand a Strong, Durable Gas Mantle with a high candle power, and at popular prices. The Trade can now absolutely rely upon being able to supply such a mantle in the Laddite.

Awarded
Gold Medal
Franco-British
Exhibition
1908.

Mantles
made and
supplied for
oil, gasoline
air gas,
acetylene,
and light-
houses.

THE STAR OF THE MANTLE WORLD



The Mantle HARDENS
and INCREASES in
Candle Power as it burns

Full
particulars
of the
merits of
the Laddite,
together
with terms
for
wholesale
and retail
trade,
furnished on
application.

Millions of Laddite Mantles now in use throughout Great Britain and abroad.

Manufacturers under the "Laddite Process."

The Hamilton Gas Mantle Co.
LIMITED

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SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, SEPTEMBER 15, 1914

No. 18

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There are more

VITRO

NO TROUBLE

CLOSET TANKS being sold
to-day than any other make on
the market

Because:

They are beautiful in design and handsome in finish. There are no joints to open up, nor linings to leak, and when installed will outlast that of any other closet tank made. Fittings are made from the best quality ingot metal under highest grade workmanship. Each Vitro Tank is individually inspected and tested and adjusted under working water conditions before leaving the factory.

8 year old Vitros are practically as good to-day as when first installed. Would not this service increase your prestige?



PLATE C 50

Guarantee

A new tank will be given to replace one that at any time proves defective from either material or workmanship.



PLATE C 51

C 50 illustrates the Jarvis Washdown Closet with No. 5 White VITRO Tank, Hercules reinforced Birch Mahogany post, hinge seat and cover with cast brass floor flange and rubber gaskets, N.P. closet bolts.

C 51 illustrates the Montrose Washdown Reverse Trap Closet, with No. 5 VITRO Tank, Hercules reinforced Birch Mahogany post, hinge seat and cover, with cast brass floor flange and rubber gasket, N. P. closet bolts.

C 52 illustrates the Bellwood C 52 Syphon Jet Closet, with No. 5 White VITRO tank, Hercules reinforced Birch Mahogany post, hinge seat and cover, with cast brass floor flange and rubber gasket, N.P. closet bolts.

Write for circular and name of the nearest appointed Jobber who handles VITRO Tanks.

Cluff Manufacturing Company

Limited

65-75 Sterling Road, TORONTO, Ont.

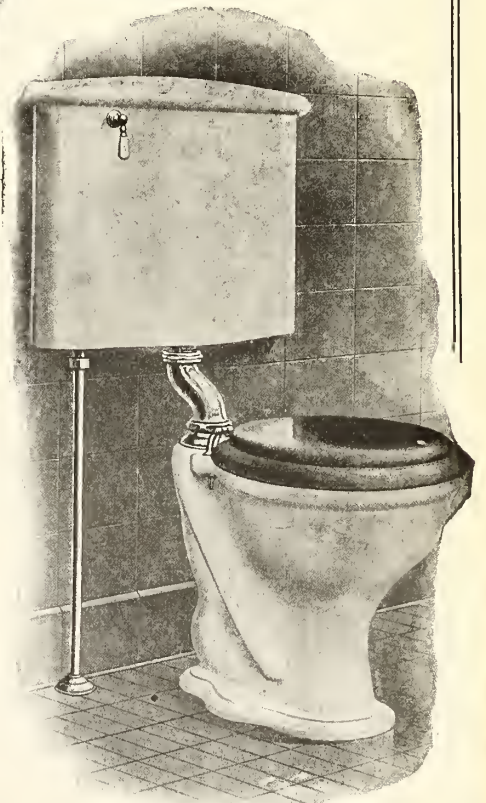


PLATE C 52



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MADE IN CANADA STEEL AND RADIATION, LIMITED

These **PLANTS** are devoted exclusively to the
manufacture of the famous



"KING" Boiler.

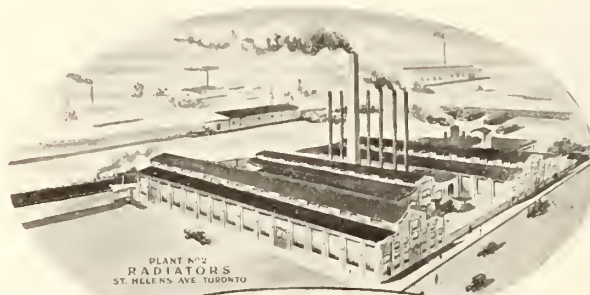
Our Products are designed and manufactured in our own plants and by our own efficient staff of Engineers and Skilled Mechanics.

- "King" Hot Water Boiler
- "Royal" Round Steam and Water Boiler
- "Royal" Square Steam and Water Boiler
- "Royal" Tank and Laundry Heaters
- "King" Radiator
- "Imperial" Radiator

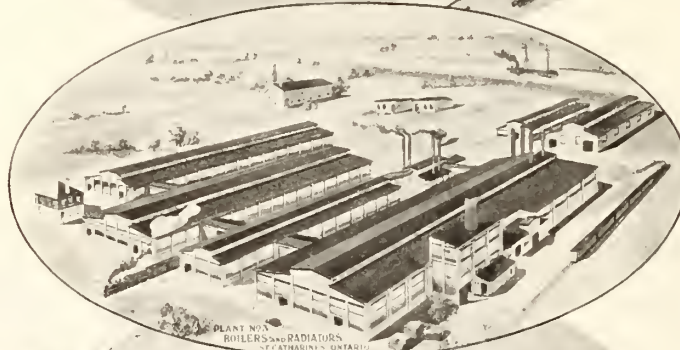


"KING" Radiator

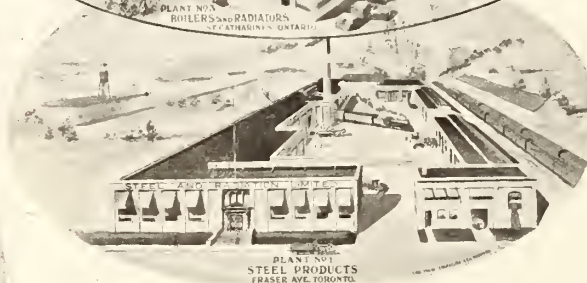
Insist on having these **Canadian** made goods installed on your contracts.



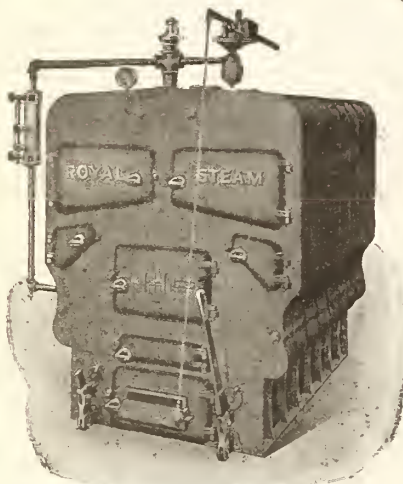
PLANT NO. 2
RADIATORS
ST. HELLAS AVE. TORONTO



PLANT NO. 3
BOILERS AND RADIATORS
ST. HELLAS AVE. TORONTO



PLANT NO. 1
STEEL PRODUCTS
FRASER AVE. TORONTO

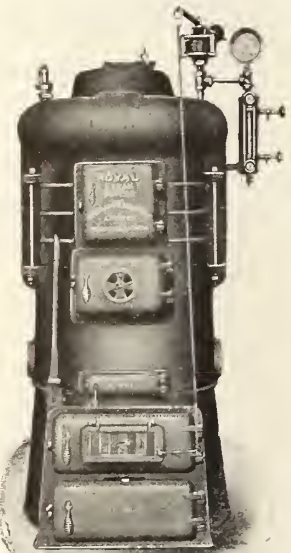


"ROYAL" SQUARE BOILER.
STEAM.

Did you get our new Boiler and Radiator Catalogue?
If not, drop us a card.

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Prompt Delivery.



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BOILER. STEAM.

STEEL AND RADIATION, LIMITED

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101 ST. JOHN ST., QUEBEC

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THE SANITARY ENGINEER

VOL. VIII.

SEPTEMBER 15, 1914.

No. 18

Interesting Sheet Metal Industry Plant

To Even the Casual Observer It Must Be Amply Evident That Sheet Metal Products in Almost Endless Variety Are Features of Industrial Enterprise Sufficiently Important to Place Them in the Very Front Rank of Twentieth Century Developments. An Insight Into What is Being Achieved, Both Utilitarian and Highly Ornamental, May Be Acquired by a Careful Perusal of The Accompanying Article.

ONE of the most progressive firms in the sheet metal industry is that of the A. B. Ormsby Co., Toronto, who having become associated with the Metal Shingle & Siding Co., of Canada, found that their former premises were too small to take care of the increased volume of business. Their new plant is located in Toronto at the corner of King and Dufferin streets, and is thoroughly up-to-date in every detail. The main building is two storeys high, of brick and with concrete floors throughout. Occupation was had early in November, 1913. A few improvements are being added this season and when these are finished the new factory will be a model of convenience.

Sheet metal has become more and more widely known of recent years and its use, more extensive. Metal is being used in all classes of building as a preventative of fire. Thus to-day its various uses are almost unlimited. One can

easily see then that the product of such a plant as the A. B. Ormsby Co., is of an exceedingly varied nature.

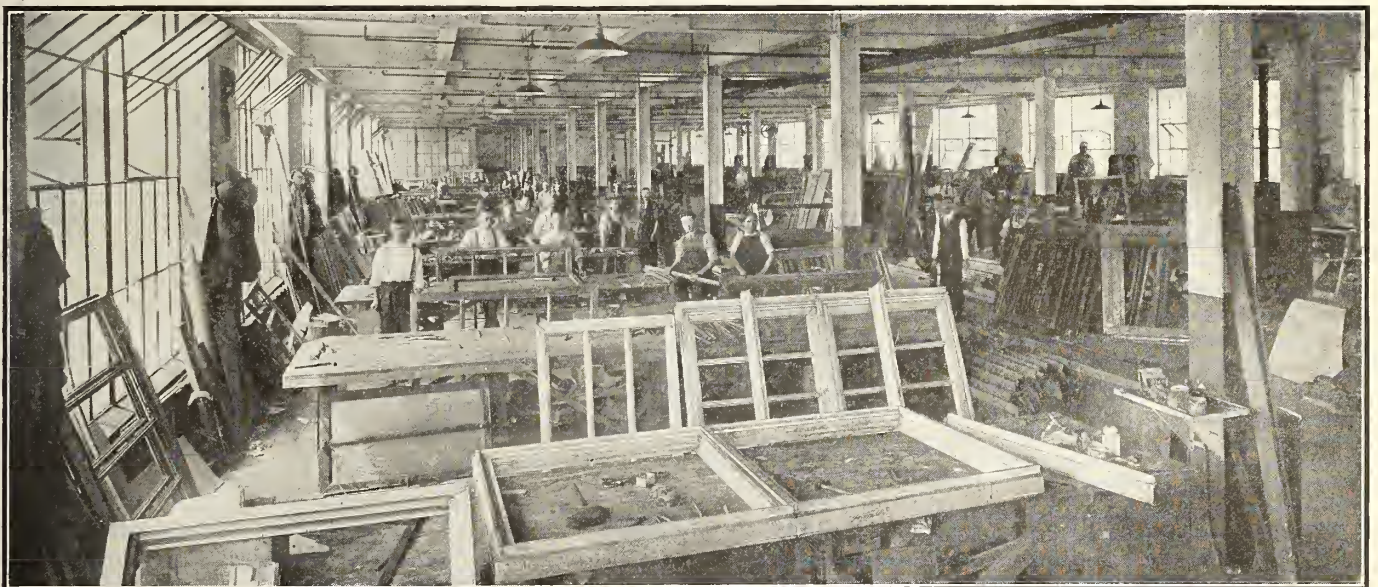
Lines of Product.

The most important lines are as follows:—Various kinds of sheet steel for siding and roofing, and large sheets of corrugated steel. The smaller sheets, steel siding plates, are stamped in various designs, more or less ornamental. A large part of the factory is given up to the hollow steel department. Here are made various articles, chief among which may be noted wall panelling, partitions, hollow doors, and interior trim. These products are all beautifully enamelled to represent oak, mahogany and other finishes. In another department steel sash and steel window casements are made. Various grades are produced, from those of plain painted steel for factories and warehouses to the highly

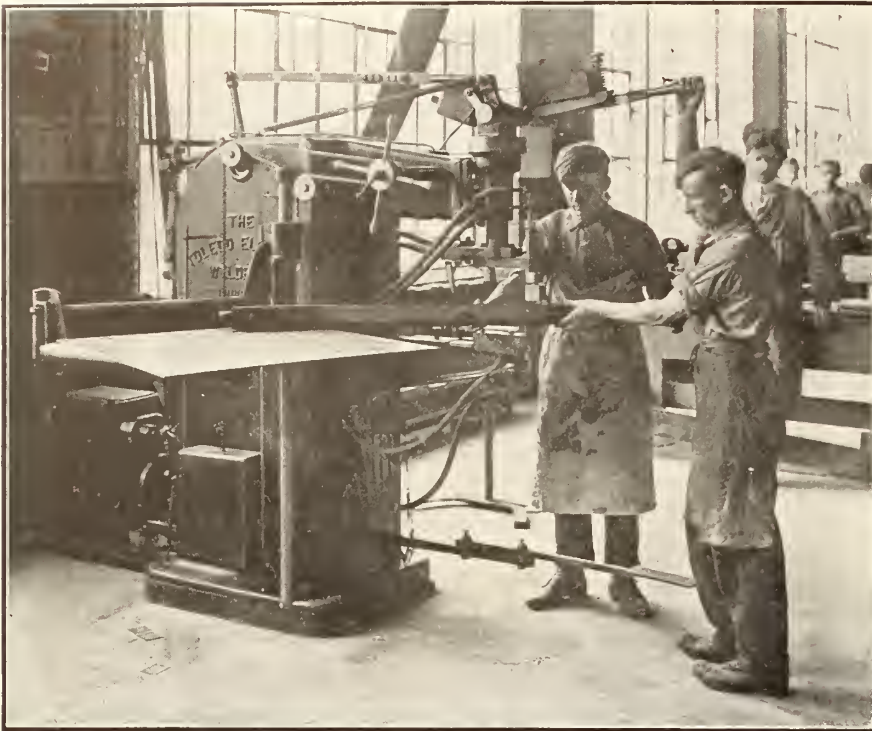
decorative variety used in the best class of buildings.

The Kalamein Process.

The kalamein department is also extensive. This process is used largely for doors, window sash, and mouldings. The method of manufacture is to build doors and sash of good dry wood, laminated to prevent warping or distortion, and to cover them with sheet brass or copper, and any one of a dozen or more colors can be obtained by the proper chemical treatment of the metal. These colors and finishes, thus made, are permanent. A large market has also been created for galvanized iron kalamein work, because it is fireproof and much cheaper than hollow steel products. Various woods are used according to the class of work. In the highest grade, mahogany is used, while in the cheapest lines a good grade of white pine answers the purpose. All the wood used is kiln dried to ensure



Sheet metal shop, A. B. Ormsby Co. plant, Toronto.



Spot welding machine in hollow steel shop.

its being thoroughly seasoned and perfectly dry. Still another product of this department is that of revolving doors, and also more or less veneer work. In a general way this comprises the list of products of the factory.

The Power Feature.

Nearly three hundred horse-power is used about the plant. This is supplied through various units by Canadian Westinghouse Co. motors. There are in all sixteen motors varying in size from 75 horse-power down to $2\frac{1}{2}$ horse-power. The arrangement makes a very economical installation because the motors only run when the machines they operate are being used. One motor usually drives a length of line shaft to which various machines are belted, but some of the larger machines have individual motors.

There is also a power house in connection with the plant: it is not under the roof of the main building, however. Here will be found a battery of three return tubular boilers, supplied by the John Inglis Co., Toronto. Two of these boilers are 78 inches in diameter by 20 feet long, and one 72 in. diameter by 16 feet long, being rated at 150 h. p. and 100 h.p. respectively. They are built for a working pressure of 125 lbs. This pressure is required by the enamel ovens which are situated in the factory proper. Atmospheric pressure steam is used for heating the buildings themselves, and from atmospheric to 5 lbs. pressure is used in the dry kilns.

The boilers are so arranged with high and low pressure headers that each or all boilers may be used on high pressure or

low pressure as may be required, the steam being by-passed through reducing and controlling valves. It is also possible to take from one boiler 125 lbs. pressure steam for the enameling ovens, atmospheric steam for the heating and low pressure steam for the dry kilns. This also is possible from each or all boilers.

Factory Heating.

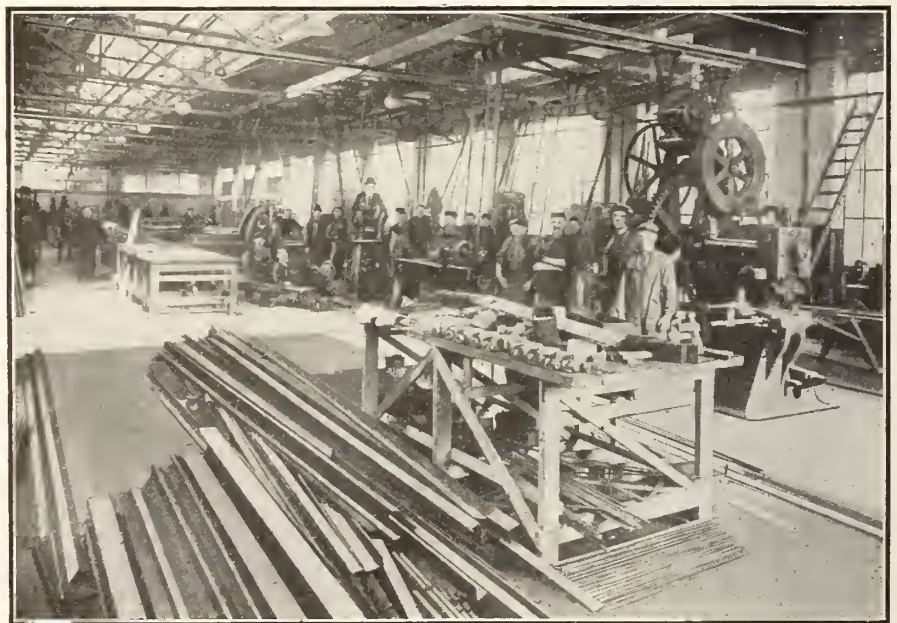
The general heating in the factory is that of the vacuum system, all the heating in the different departments being accomplished through radiators placed along the outside walls. There is, how-

ever, one exception to this, in the case of the large shop, there being 2 38-in. high column radiators and coils of $1\frac{1}{2}$ in. pipe in the monitors. On every unit there is placed a Webster water seal motor valve for controlling the amount of steam which is passed through the radiator or coil. The return lines from the different buildings are carried to a vacuum pump through Webster condenser heads and lift fittings to the 10-12-12 in. Bawden vacuum pumps. The vacuum pumps discharge the water of condensation into the receiving tanks, from whence it drains by gravity to the boiler feed pumps, which are 10-16-12 in. The boiler feed pumps operate through an automatic control.

The general heating scheme is arranged as follows: A 12-in. low pressure header is carried to an 18-in. wrought iron low pressure steam distributing header, from which steam is carried to every building in a separate line. Each building and every separate steam line is controlled with its own valve on the header. Thus the engineer in charge has complete control of the entire radiating system from the boiler room.

The boilers are operated under induced draught, the stack being only forty feet high. A 120-in. Canadian Sirocco standard steel plate fan of extra heavy steel, has been placed on top of the boilers, and is direct connected to a 7-in. x 7-in. American Buffalo Forge vertical engine.

It is possible through this medium to carry any draught required up to as high as $1\frac{1}{2}$ in. water gauge. This also allows the use of a cheap grade of fuel. At present there is being burned a half and half mixture of hard and soft coal screenings, with practically a total elimination of smoke.



Machine Shop.

In the enameling ovens where a pressure of 125 lbs. is required there is placed in each oven two coils of 1-in. extra heavy pipe, each coil having a header of 3-in. extra heavy wrought iron pipe, tapped out for the 1-in. pipes which are screwed into it. The returns are carried back through Mason side lug high pressure steam traps to the receiving tank in the boiler room. These coils make it possible to raise the temperature in the ovens to 300 degrees Fah. very quickly.

The plant has been so designed that three additional storeys may be added at any time, and the present equipment will be amply sufficient to take care of same.

Machinery Equipment.

In the carpenter shop and kalamein department are to be found a large number of wood working tools. These have been supplied largely by the Canada Machinery Corporation, Galt, Ont., and consist of edgers, groovers, band saws, rip saws, planers, etc. A 30 h. p. motor driving a Canadian Sirocco suction fan carries the saw-dust and shavings from each machine to the power house where they can be blown into the boiler fire-boxes and burned, or into a vault from which they can be stoked into the boilers by hand when desired.

In the machine shop, a 75 h.p. motor is connected up to a Pokorny & Wittekind air compressor. The firm making this machine is located at Frankfort-on-the-Maine, Germany. Their product varies widely from the prevailing American design. This machine has one cylinder of two bores, and by an ingenious differential piston it does duty as a two-stage compressor. An inter-cooler is mounted on the top of the

cylinder, which is horizontal. The valve in the compressor is mechanically operated, and is known as the Koester piston valve gear.

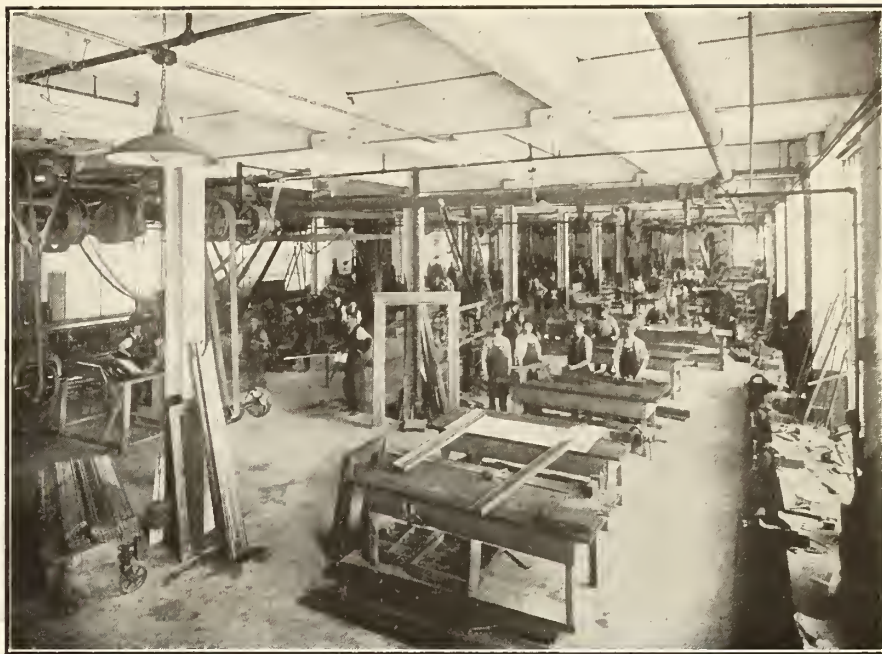
An extremely ingenious device is fitted to the compressor to prevent it from putting excessive pressure on the receiver. When the pressure has reached one hundred pounds per square inch, the device closes the air intake valve and the compressor runs idle until the pressure becomes sufficiently reduced; it then takes up its load again. The capacity of the compressor is 320 cu. ft. of free air per minute, its stroke is $15\frac{3}{4}$ in., the bore of the large end of the cylinder is $18\frac{1}{8}$ in., and the compressor is run at

145 r.p.m. The air intake is in the roof. This intake leads from the compressor and consists of an 8-in. pipe with a T fitted on the end, in each end of which a short nipple is screwed. To each nipple an elbow is fitted with open end down. Two large galvanized iron funnels are fitted over the ends of the elbows and screened.

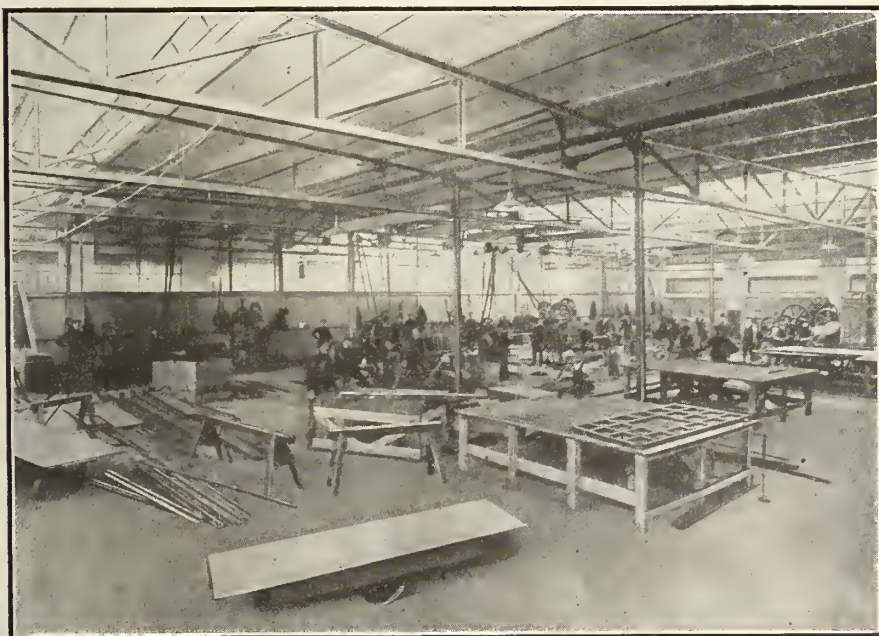
Air is used in the sand blast system which is a Hoevel unit. Both the compressor and the sand blasting unit were supplied by R. M. Fotheringham, Toronto, who has the Canadian agencies for both firms. Air is also used in the hoist in the paint shop, and in the pneumatic tools in the machine shop. These latter are all Cleveland pneumatics. In the power house the air is also used for blowing out boiler tubes and for removing ashes. The use of the air is of course more or less irregular and this varying load causes the automatic cut out to work frequently. As this compressor was somewhat unique in design and seems to have given excellent satisfaction, its description at some length was thought advisable here.

Machine Shop.

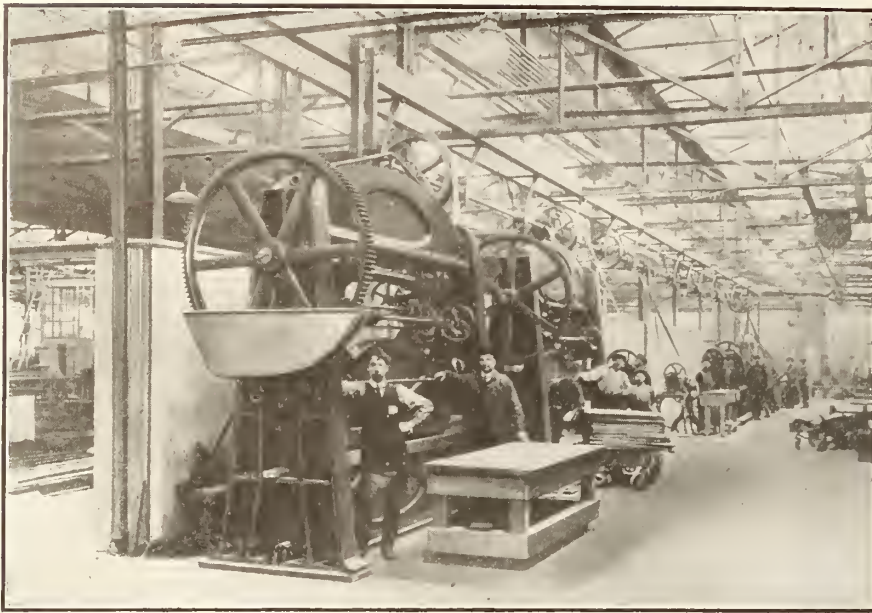
In the machine shop is installed a very complete range of machine tools consisting of lathes, shapers, planers, drill presses, punches, shears, and several automatic machines which execute certain operations to parts of the standard steel sash. Among the interesting machines are two triple combination plate shears, punches, and bar and angle cutters, purchased from the Wiener Machinery Co., of New York. These machines have solid steel frames permitting compactness which makes them most suitable and



Hollow steel shop.



Steel sash shop.



Shearing and forming department.

economical for crowded shops. Without change of tools they are capable of splitting plates of unlimited length, cutting flat bars, shearing off rounds and squares, cutting and mitering both right and left hand angles and tees at any degree, and punching plates and structural material either of web or flange form. With interchangeable tools, beams, channels, Z bars, etc., can be cut. The punching tools can also be interchanged for coping and mitering tools.

Process of Manufacture.

The rolled steel sections are stored in receiving sheds conveniently located near the company's railway spur. This raw material enters the shop and is cut to length. Then it passes from machine to machine through the successive operations which make it a finished part. The various sections each pass through their respective series of cutting, punching, shearing, etc., and are passed on to the assembling department. Here the pieces are riveted and welded and a finished sash turned out.

Sand Blasting and Pickling.

There are two small departments of no little importance located at the entrance to the storage and packing department. These are the sand blasting room and the pickling room. On the sand blasting room the hollow steel work is cleaned and finished preparatory to being enamelled and grained. This is done by means of a spray or blast of sand working under high pressure. The blast plays on the comparatively rough steel product and the result is a smooth polished surface which is pleasing to the eye.

The sand blasting room is a brick building well lighted from the roof and sides, and is equipped by the Hoevel Sand Blast Machine Co. of New York.

The equipment consists of a sand blast pressure tank, an automatic sand conveyor, and a bucket elevator with a dust arrester. The sand after leaving the pressure tank strikes the castings and falls through a grate into a trough containing a screw conveyor. The latter delivers it to one end of the trough where it is raised by the bucket elevator and discharged through a device that separates the dust from the blasting sand which goes back to the sand blast pressure tank. The power necessary to operate this circulatory system exclusive of the pressure-tank is about 1 to 1½ horse-power; an unusually small power consumption for this purpose. The dust created in the blasting-room is exhausted by a fan and passes through a sand arrester which intercepts all particles of sand while the lighter dust escapes to the atmosphere. For installations where the amount of dust is considerable, or objectionable, the Hoevel Sand Blast Machine Co. provide an air filter for the exhaust which effectually prevents any

dust passing into the atmosphere.

In the pickling room the copper and brass kalamein work is cleaned in acids and the various finishes obtained by submerging the pieces in different solutions. Near the power house, but in a separate building is the paint shop where the steel frames and sashes are dipped. The dry kilns are also located near this building, while a little further along the garage is located, over which is the dining hall.

Employees' Welfare.

Throughout the various departments of the plant the comfort of the employees has not been forgotten. Clean sanitary wash rooms are provided as also are lockers which were made in the shop. The sides of the buildings throughout have been constructed as far as possible of glass to give the best natural light. The monitors also are largely of glass. The machines are all located so as to make the very best use of the excellent light.

The factory is also equipped with powerful incandescent electric lights in frosted globes and fitted with powerful reflectors. A large number of smaller incandescent lights are distributed about the various departments. The windows in the monitors and side walls all open, so that a very efficient ventilating system is thus aided during the summer months. Throughout the whole plant and in the yard there is a monorail system for the rapid and convenient handling of heavy materials.

An automatic sprinkler system is installed and provision has been made for further extension of this system. An underground tank is to be added as also a steam driven pump. Bennett & Wright, Toronto, installed the sprinkler equipment, as also the heating and ventilating systems. The plant enjoys an exceptionally low rate of insurance and when this further addition to their sprinkler system is completed their rate will be as low as can be obtained.



Assembling hollow steel doors.



View of Grounds and Lake, Canadian National Exhibition.

Canadian National Exhibition, 1914

Greater Number of Exhibitors in the Sanitary and Heating Trade Than Ever Before—Canadian Manufacturers Enthusiastic — A Fine Display of Exhibits Proving That Great Progressive Strides Have Been Made Since the Last Exhibition.

AS far as the sanitary and heating engineering profession can judge this 1914 exhibition, from the standpoint of success or failure, we would without hesitation describe it as the greatest success ever.

Since the last exhibition there has been splendid progress made. Cast iron enamelware has been perfected by giving to the world an enamelled all-over fixture. Had the question been discussed a few years ago, our greatest experts would have doubted the possibility of enamelling a bath inside and outside. To-day it is an accomplished fact.

Steam heating has taken great strides. 1914 finds it possible to heat buildings with vapor steam thermostatically, controlled by wonderfully simple contrivances.

These thermostatic controlling devices can be adapted to all kinds of heating, steam, hot water, or warm air by direct, indirect or direct-indirect. The greatest heating engineer of the day would have disputed such a possibility a few years ago.

Brass goods is another line which has taken great strides, to speak of a ball bearing, self closing faucet a few years

ago would have been ridiculed by the best mechanic in the trade and a packless valve would have been out of the question. Both these are now an accomplished fact, and at a price which is within the means of any ordinary working man.

For a man to state that a $\frac{1}{8}$ h.p. electric motor would pump water to a pressure of 60 lbs. and supply a large enough volume of water at that pressure to serve a family of six persons day in and day out, would have been enough to relegate him to the lunatic asylum.

This is not only an accomplished fact, but such a system is automatically controlled too, and it requires only very ordinary skill to install such an appliance.

Heating water by gas was considered not only a luxury, but an expensive one at that. To-day the house which does not have a gas heater is considered behind the times. It is possible to get an automatic gas heater to heat water for domestic purposes at cost of from \$25 to \$75. Such was unheard of a year or two ago.

For several years the greatest vacuum engineers declared that to successfully

clean a carpet, or clear house of dust, would require a high vacuum, and to dispute such an opinion would have been declared ridiculous. To-day it is proved without doubt that it is not so much high vacuum as volume of air with moderate vacuum, that is required.

All these progressive strides bear upon our profession as sanitary and heating engineers. The day is not far distant when we will no more think of dispensing with the vacuum cleaner than we will of some form of heating or sanitary appliance. Then let us agree that the 1914 Canadian National Exhibition was a wonderful success. It is not numbers which make a success, else the Mad Kaiser's army would not now be fleeing from the friends of freedom.

No doubt there was not the crowd in attendance that visited the exhibition last year, but as regards actual accomplishments it was a decided success.

Upon entering the Machinery Hall turning to the right The Star Expansion Bolt Company, represented by H. F. McIntosh & Co., Adelaide St. East, Toronto, had a splendid exhibit of every style of expansion bolts for use with either small screws or large lag screws, which

could be used for either wood or cement. If more of these goods were used by sanitary and heating engineers there would be less time wasted when putting up a heavy fixture on a wall and fewer of them would become loose. Many a radiator has on this account dropped down at one end and caused the condensation to accumulate and fill up the radiator with water.

A very interesting exhibit was that of **The Nash Temperature Control Co., Ltd., Toronto**, which spoke volumes to those interested in automatic heat controlling devices. This company has a very novel system of controlling the humidity of a room; it being acknowledged by experts that when a room is supplied with a proper amount of humidity, almost 10 per cent less heat is necessary.

The Canada Metal Co., Ltd., Toronto, was on hand at the old stand with a splendid display of metals in almost every form, all kinds of solder for every trade, aluminum ingots, lead pipe, traps and lead wool. They also had a splendid line of plumbing fixtures. This latter being practically a new line with the company, and one which will be kept up to date with the very best line of goods.

The United Electric Co. was represented by their Toronto manager, James J. Martindale, 159-161 West Richmond St. Their exhibit being a Tuce stationary air vacuum cleaner, and to see the way the machine would pick up iron washers, string, and the very finest of dust was a treat. One lady expressed her opinion that it would not be safe to leave the baby playing on the rug with a Tuce cleaner anywhere near. Some very interesting booklets were distributed which can be procured free by writing to above address.

The next exhibit was that of **The National Equipment Co., Ltd., Wabash Ave., Toronto**, with a splendid array of **Peerless Water Systems**, several of which were in operation. These systems have become a standard line throughout the whole of the Dominion, are simplicity itself, and are positively automatic. The very mention of water systems for country residences leads one to think of **The Peerless Systems**.

One of the latest wrenches to be placed upon the Canadian market is the "Dickson Automatic" wrench, which is being manufactured by **The Canadian Tool Steel Co., Ltd., Toronto**. There were several demonstrators on hand showing the novel features of these wrenches. Mr. Dickson, the inventor, was also in attendance and could no doubt show the wonderful advantages which he claimed over some wrenches now on the market.

The Canadian Morehead Mfg. Co., Ltd., Woodstock, Ontario, had a fine display of **Morehead Steam Traps**, which are becoming more general in use every day. Many a steam heating installation has been thereby turned from a poor to an efficient heating plant, thus not only resulting in a saving in fuel but also giving better service. Those interested in steam heating should procure a booklet which describes the **Morehead Trap**.

If there is one portion of a heating installation which has received less attention than other parts, it is the grate bar, that is until recent years, and even to-day some of the largest factories in the world are using the common stationary grate bar. **The Galt Foundry Co., Galt, Ont.**, had, however, a couple of very interesting sets of grates, called **The McNaughton Grate Bar**. They are a sectional shaker typed grate and are very novel in construction. Every heating engineer who wishes to make, not only a little more money, but also a reputation for himself should enquire into the merits of this bar.

To the left on entering the machinery hall was a fine display of pumping apparatus, the exhibit of the **General Machinery Co., Ltd., Mulock Ave., West Toronto**, all of which were in operation. Several pneumatic systems for country residences were shown, but the one which seemed to draw the crowd was that of a large Luitweiler pump, all of which was fastened upon a base and standing upon six ordinary tumblers. A quantity of colored fluid was placed in the glasses to show the minimum of vibration.

In the Industrial Hall a large number of supply houses and manufacturers were represented.

James Robertson Co., Ltd., were at their old stand, with a splendid line of new goods, showers of various kinds, steel w.c. seats and tanks. An expert was in attendance demonstrating their new radiator return valve, which was fitted up to a radiator, steam being supplied from a range boiler.

The Standard Ideal Mfg. Co., Port Hope, were again on hand with some of their latest products. New styles of baths, enamelled all over, different kinds of lavatories, and beautiful brass goods. Their new black-enamel laundry tub caught the eye of scores of visitors.

The James Morrison Brass Mfg. Co., Ltd., Toronto, were not satisfied with one stand this year. They have recently acquired several patent rights, one of

which is that of the Stack gas water heater. Mr. Powley was in charge of this exhibit, which seemed to draw quite a crowd. Never was there a larger assortment of gas heaters on exhibit than this year. Mr. Bellon was in charge of their old stand, which comprised a splendid assortment of their brass goods.

If there is one line of manufacturers who have made more progress than another it is the manufacturers of domestic sanitary and heating goods, etc. Among those manufacturers who deserve a considerable amount of credit are the manufacturers of cast iron enamelware. **The Standard Sanitary Mfg. Co., Ltd., Toronto** had a splendid array of goods on exhibit, the finish of them was beyond criticism. One cannot but think what great strides have been taken in this line, when one remembers that comparatively a few years ago a copper, or zinc-lined bath was looked upon as a luxury in a home. To-day very few persons would ever dream of installing such a one.

The Mueller Mfg Co., Ltd., Sarnia, had a very nice exhibit, two of the main features being a new sanitary drinking fountain and a practical demonstrating unit in connection with their water work tapping machine. The brass goods exhibited were of a very fine grade, all of which were reasonable in price. Of all brass goods which should command a higher price those used in the sanitary and heating trade stand first. None are subject to more severe usage, yet sad to say there are to-day goods on the market which leave much to be desired, and the public are beginning to realize that high grade brass goods are the best investment.

The Tallman Brass Mfg. Co., Hamilton, were on hand with a most elaborate display of lighting fixtures. They had also a large quantity of various grades of solder. Solder nipples and ferrules as well as cleanouts. Sanitary engineers would do well to look into the lighting question more than they do.

Dr. Hodgetts, when speaking at the Canadian Society of Domestic Sanitary & Heating Engineers' banquet in Ottawa, said "No doubt the question of lighting is one which is of a sanitary nature. No person can be physically or even mentally sound if suffering from poor eyesight, and poor lighting is responsible for more physical wrecks than anyone can imagine."

R. Bigley & Sons., Ltd., Toronto, had a very fine display of ranges and stoves, etc., and also a large number of various kinds of heaters, and hot water furnaces, all of which reflected great credit on their mechanical and business enterprise.

(Continued on page 23.)



MAGNIFICENT DISPLAY OF SHOWERS FEATURE OF THE JAMES ROBERTSON COMPANY'S EXHIBIT

IT is an incontestable fact that a good shower is becoming as indispensable to a bathroom as the bath tub itself.

Consequently, the main part of the James Robertson display was devoted to a showing of bathroom shower equipment—all the way from the small, low-priced shower which can be attached to any ordinary bath-tub, to the specially built-in fixture that would be specified in an elaborate bathroom.

It was most gratifying to note the interest which the trade showed in this departure, for it opened up a line of thought which sanitary engineers may depend upon to provide them with considerable work for the next few years.

Not only so, but the influence on the outside public could not be gainsaid. Scraps of conversation were overheard, something like the following:—"There's what we have got to have in our bathroom—a shower. It's the one thing to make it complete, and I intend to put it in right away." Remarks similar to this were heard all day long.

For there is no doubt about it, a properly equipped shower bath is a health-promoting addition to bathroom equipment.

In view of this interest, therefore, we suggest that our readers should get into touch with the James Robertson Co. and get from them illustrations and particulars of their most popular lines in showers, with a view to drumming up some business in this line between now and Christmas. The Sanitary Engineer

whose business has fallen off, or shows signs of falling off owing to a decrease in local building activity, should take hold of this shower idea, make a canvass among all the best homes in his locality, and get orders to put in shower equipment. We think the result will be both profitable and a mighty good advertisement for men who take hold of it and work it in the right way.

The writer could not help but be impressed with one other fact that made the Robertson exhibit doubly important, and that was that the James Robertson Co. is essentially a Canadian concern—a concern that has practically "led the van" in the development and perfection of sanitary equipment in Canada. Now that there is so much talk in the air of buying "Made in Canada" goods, it is well for the trade to bear in mind this point. Not that we love the makers of American goods less, but during these strenuous times we should love the Canadian makers more.

Next to the showers, the other strong feature of the exhibit was the showing of the "Sanisteel" products, it being a matter of considerable comment that these steel products could not be told apart from those made of porcelain or earthenware; in other words, having all the beauty of the latter without the disadvantage of breakage, besides being more sanitary and just as easy to keep clean.

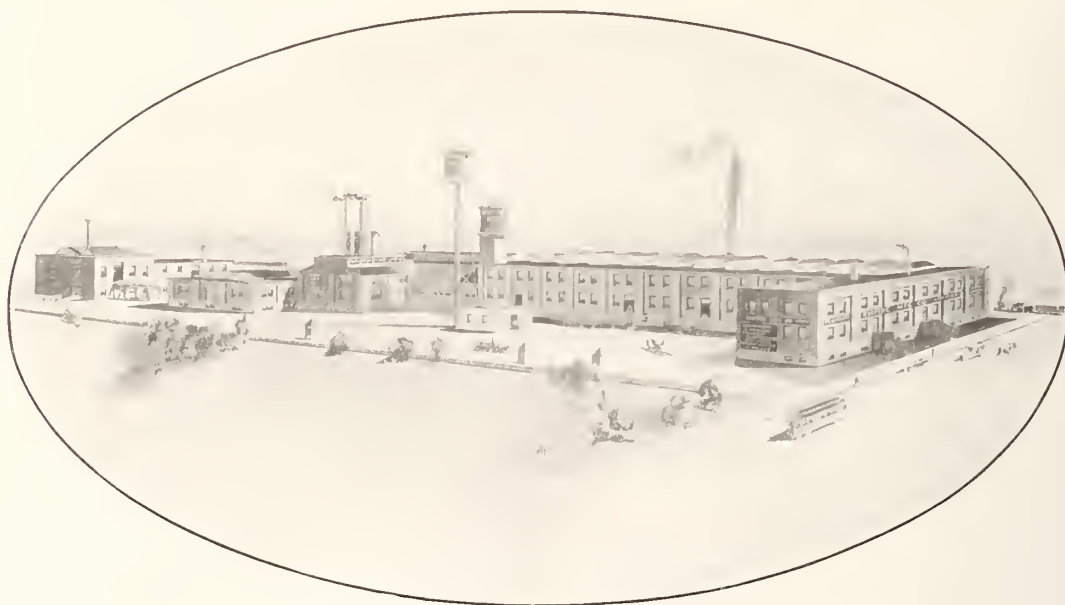
Altogether, the exhibit may be said to have fully represented the equipment and capacity for service of what is acknowledged to be one of the largest plumbing supply houses in the British Empire.

This is Where EMPIRE Brass Goods

"The Best"

NOT THE CHEAPEST

are Made



IN 1907 we moved into our new factory. At the time we thought we had allowed for sufficient increase of business by more than doubling our capacity; however, we found it necessary in 1911 and again in 1913 to add additional buildings. To-day we have one of the most complete factories on the American continent. We have our own smelting plant, including a chemical laboratory, and all ingot is made up to special analysis. Our foundry is equipped with the most modern compressed air and power moulding machines made, while throughout

the machine shop and plating departments we have installed automatic machines and devices, which not only insure us of a perfect article but allow us to reduce the cost of manufacture.

Thorough test and absolute guarantee are features which go with every article of our manufacture. The word **Empire** or the letter E appears on every article of our manufacture, and is a trade-mark which has come to mean the perfection of plumbers' brass goods.

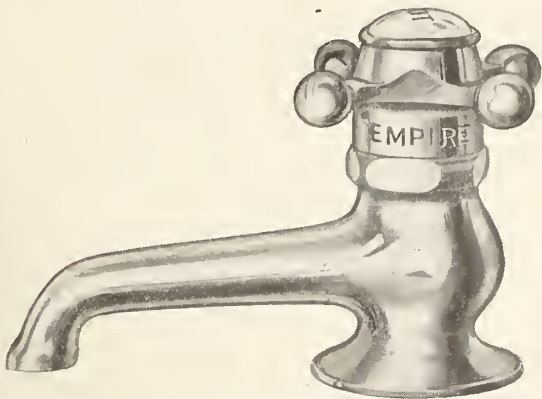
Empire Manufacturing Co., Limited

LONDON, CANADA

MANUFACTURERS OF AND DEALERS IN
PLUMBERS' AND STEAMFITTERS' SUPPLIES OF ALL KINDS

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

EMPIRE Canadian - Made Products



Ball-bearing, Self-closing
Basin Cock

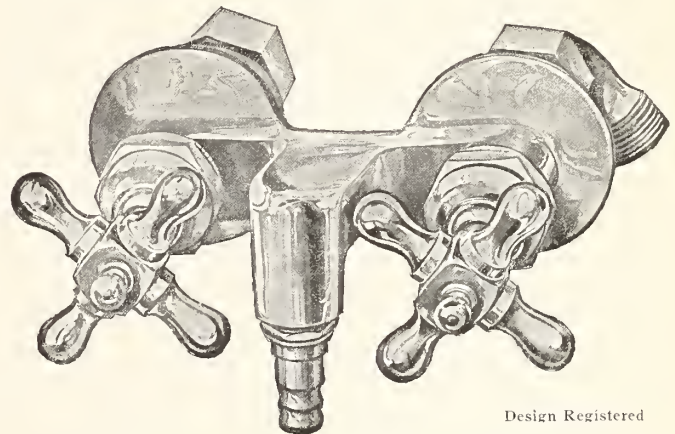


Side Handle, Quick Pression
Basin Cock

HURONIC PLATE A12 B

Quartered golden oak, piano polished tank and seat. Extra large tank, ensuring good flush, and made with dowelled joints.

We carry a stock of tanks and seats in all finishes, and if necessary are prepared to match perfectly the woodwork of any room if a sample is supplied us.



Design Registered

No. 2 Midget Compression Basin Cock

Empire Manufacturing Co., Limited

LONDON, CANADA

MANUFACTURERS OF AND DEALERS IN
PLUMBERS' AND STEAMFITTERS' SUPPLIES OF ALL KINDS

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."



Display of The C. A. Dunham Co., Limited Toronto

AN unusually interesting exhibit both in attractiveness and purpose was found in the booth occupied by the C. A. Dunham Co., Ltd., Industrial No. 4.

The main feature of this exhibit was the demonstrating and explanation of the working of their new way of residence heating—The Dunham Vapor System of low pressure steam.

The use of a thermostat temperature controller in the living room operating to maintain an even temperature in the building. A new departure in steam gauges being an electric pressurestat operating on the steam supply to maintain a sufficient pressure to give the desired temperature. The system is designed to work on less than twelve ounces pressure.

The thermostat and pressurestat working in conjunction and operated on two dry cell batteries through a gravity motor opening and closing the draft and check dampers on the boiler to control the fire. The use of the Dunham Packless Inlet Valve on supply to radiator (top connection) and the well-

known Dunham Radiator Trap on the return from each radiator made the system one of unusual flexibility, convenience and economy in operation.

The system had features of particular interest to the public in that it was so simple of operation, economical as to fuel and free from damage by leaky air valves or trouble from freeze-ups.

Those of the trade also who had not had the opportunity of investigating it, after a thorough demonstration gave it their full approval and expressed the desire of an early opportunity to install the system.

A full complement of the Dunham products manufactured entirely in Canada were on exhibit and many expressions of entire satisfaction were heard from past users of Dunham Radiator Steam Traps.

A new Bulletin, No. 11, has been issued by the C. A. Dunham Co., Ltd., on the Dunham Vapor System of heating for residences. Those of the trade who have not already done so should get a copy immediately.

CANADIAN NATIONAL EXHIBITION.

(Continued from page 18.)

Display of The Waldon Co., Ltd., Lumsden Buildings, Toronto.

Several complete boilers, as well as separate and partly constructed boilers, were exhibited, and the demonstrators were kept busy every moment showing and explaining the good features, of which there are many, in the makeup of the Spencer boiler.

The Spencer boiler came in for a fair share of enquiries as a result of the display of the **Waldon Co., Ltd**

The Laddite Gas Mantle was quite an interesting feature at the exhibition. This mantle is said to be much more efficient and durable than the mantles made in earlier times. The **Hamilton Gas Mantle Co., Ltd.,** Hamilton, made no small impression upon those who stopped to view their very creditable exhibit of Laddite Gas Mantles.

There are three things necessary to attain success, viz:—Publicity, personality and profit. If you are well known to the public, and you put lots of personality in your products, or achievements you are bound to profit by it and if you are a sanitary and heating engineer, you should put a name plate on each and every installation. Then, providing you have put some personality in the work, it will be identified by the name plate, for good or ill according to the merits of the installation.

Messrs. **Patterson & Heward of King Street West, Toronto,** had a splendid exhibit of name plates suitable for every line of business and unless one sees for themselves it is impossible to estimate the importance of such an enterprise as that carried on by this progressive company.

A. Welch & Co., Queen street, Toronto, carrying on business as hardware merchants, sanitary, heating and ventilating engineers, had a splendid exhibit. They demonstrated various lines, including gas stoves and heaters. This progressive company are handling a line of steam and hot water furnaces, as well as a new pressed steel radiator. This is said to be the only pressed steel radiator made in Canada, and is manufactured by **Clare Brothers, Ltd.,** of Preston, Ont., who will be only too pleased to supply all information regarding them.

Heating specialties are coming more to the front to-day than ever before, because they play an important part, both for comfort and efficiency. The **C. A. Dunham Co., Ltd.,** Toronto, were on

hand with a full line of heating specialties, which certainly was a credit to them. A staff of capable demonstrators was at the disposal of every inquirer, and many a time during the two weeks of the exhibition it was impossible to get within easy distance because of the interest taken in their interesting exhibit.

The demand for instantaneous gas water heaters was never so great as it is to-day. It seems to be the cry that when hot water is wanted, it is wanted at once. The **Vici Radiator Company of Hamilton,** created quite a little interest with their exhibit of **The Parrott Heater.** This heater is said to do all that can be claimed by the most expensive heater, and is not so costly. Several unique claims are made which should be of interest to those who install such appliances.

Competition has created more specialists than anything else. To be a fore-runner in any one line is sure to bring results of a very creditable nature. The **B. O. T. Manufacturing Co., Ltd.,** Richmond street, Toronto, have done nothing if they have not earned a very creditable reputation as manufacturers of high grade w.e. combinations. Their exhibit was a very commendable one, and of such an assortment as to suit every purse where a serviceable combination was wanted.

The **Moffat Stove Company, Ltd.,** Weston, Ontario, had a fine display of stoves and ranges. They were also exhibiting a new gas heater known as "The Moffat" for which some very interesting claims were made. In fact it might be stated that the gas water heater was the most ably exhibited article in the exhibit not less than a score firms having one, and some several styles included in their respective stands.

The **Aylmer Pump & Scale Co., Ltd.,** Aylmer, Ont., had quite a variety of pumps on exhibit, at their booth under the grand stand, all of which were well gotten up so as to give a maximum of efficiency. They were also exhibiting several lines of pipe cutters and die stocks, including the Premier pipe dies and Beaver square-end pipe cutters manufactured by **The Borden-Canadian Co.,** Toronto, as well as the Little Giant pipe dies, manufactured by **Wells Bros.,** of Canada, Galt, Ont.

Hamilton Health Department Makes Creditable Move.

The Hamilton health authorities have commenced a campaign against cellar

houses, and announced that several of these on Mary street, near Barton, had been ordered closed as not fit for habitation. Dr. Roberts, M.H.O., states that there are many of these places throughout the city, and that while the owners term them basements, the department looks on them purely as cellars. "There are many places in existence in the east end to-day where artificial light will have to be used in the rooms all hours of the day, and it will be a short time only when these will have to be changed," added the M.H.O. The health officer has found that where landlords rent their cellars for living purposes high prices are asked, and as a rule several families go in together to conveniently make up the necessary amount.

Editor's Comment.—Here is a move in the right direction. If 25 per cent. of the houses in Canada, which are insanitary, were to be condemned by our various civic health departments, there would be more than enough work for the whole craft throughout the Dominion. Such a move would be legitimate and timely just now, and would be of a less speculative nature than any other line of business. It would keep brass foundries, iron foundries, lead pipe manufacturers, polishers, platers, carpenters, plasterers, bricklayers, sanitary and heating engineers, sheet metal workers, painters, paperhangers, paint factories and a score other trades actually busy. We think every tradesman in the country should get up a patriotic campaign to force the banks to capitalize the building trade, and to also urge every worker to put more heart and soul into his work, so that such undertakings would prove more than warranted. The writer is prepared to maintain that if every workman were to put a little more thought, a little more patriotism, and a little more enthusiasm into his work, that he could produce at least 10 per cent. more work per day, and not feel one whit the worse. Such united action on the part of the industrial workers would more than justify the banks into opening up and lending money to the building world. Sanitary Engineer appeals to each of its readers to do his duty in this matter, and approach the proper mediums in their various localities.

New Representative for Standard Ideal Company.

Mr. F. R. Moody, formerly the Canadian representative of the L. Wolff Mfg. Co., Chicago, is now associated with the Standard Ideal Company's selling force. He is looking particularly after the architects.

Confidence Displayed

NOW that the war and all that it brings in its train has been felt somewhat, it would be well to "Must-ter up" and find out how the trade is handling the various problems which it is found necessary to confront.

Sanitary Engineer called upon quite a number of manufacturers of sanitary and heating supplies with a view of getting an opinion of the outlook. We also wrote to quite a large number. It is very encouraging to be able to report that we did not find a single pessimist in our ranks.

The recent exhibition showed that a larger number were represented than ever before. We take pleasure in reproducing a few of the letters which fairly represent the tone of all.

The National Equipment Co., Ltd., Toronto, replied by stating that they expressed their views in their advertisement of last issue as follows:—

A crisis unique in the history of the world threatens the flag that through the centuries has been carried by glorious heroes through blood and fire, that we who live beneath its folds might enjoy a degree of freedom of both thought and action, together with a sense of security, never known under any other.

What shall history say of the panicky pessimists who, at the first suggestion of disaster, suddenly close up their factories and throw upon their own resources their employees and the women and children depending upon them for their daily bread?

This Company believes that its duty lies in continuing operations at full capacity, and this we will continue to do to the extreme limit of our resources.

We are building four times more Peerless Water Systems than the present market will absorb, but our faith is strong that the true spirit of a bold and virile Canadianism, together with the great heritage of British pluck and the strong recuperative power of British institutions, will ultimately justify our policy.

Yours truly,
National Equipment Co., Ltd.

The Sanitary Engineer,
Toronto.

Toronto, Sept. 4, 1914.

Gentlemen:—We have your letter with reference to present conditions of Canada and the Empire.

This Company manufactures exclusively high grade specialties for Vacuum, Vapor and Air Line Heating Systems, so our line is not diversified, as with many other institutions.

However, we feel, and experience has proven our judgment reasonably correct, that in times of stress, as at present experienced in Canada, the consumer gives more attention to the details of his purchases, to the end that he secures more economy in the operation of his heat system rather than to benefit by low first cost.

Knowing this, and being a strictly Canadian organization, producing quality goods, we are going to run our factory very close to full time, as we feel that the trade, that is, consumers, contractors and architects, will demand Canadian made products which are equal or better than imported goods, more than ever before.

We believe in buying Canadian made goods, and if every user in Canada were to supply his needs from the Canadian manufacturers, there would not be a hungry or poorly-clad soul in this whole Dominion this winter.

Yours very truly,
C. A. Dunham Co., Ltd.

The Sanitary Engineer,
Toronto.

Sarnia, Ont., Sept. 2, 1914.

Gentlemen:—We have your letter of August 29, and responsive to your request we beg to advise that we are endeavoring, so far as it is possible to keep all of our staff working full time. So far we have not made any reduction in our hours of work, nor have we laid off permanently any of our men.

We have recently issued to the entire trade, a letter, copy of which we sent you, dealing entirely with the subject of keeping Canadian labor employed.

We are ourselves taking the initiative in this matter by eliminating wherever it is possible, purchases from the United States and other countries, and are confining our buying entirely to the Dominion, and in some cases are doing this and paying even higher prices for the goods.

We are entirely optimistic about the present situation, and up to this time have not been materially effected in a business way. The war situation is opening up tremendous opportunities for Canadian manufacturers, and no doubt some of us can take advantage of these opportunities while others, owing to the nature of their product, can not do so. However, from a manufacturing standpoint, we cannot help but feel that the war will eventually result in a benefit to the manufacturers of Canada.

Yours very truly,
H. Mueller Mfg. Co., Ltd.

The Sanitary Engineer,
Toronto.

Toronto, Sept. 3, 1914

Dear Sir:—In reply to your question of the 31st, ultimo., regarding our opinion as to the effect on business that the present war will have, we would say that unquestionably, building operations in Canada will be adversely effected. The Loan Companies are restricting their operations very considerably indeed, and until they loosen up, we are afraid business in the building lines will be slack.

We may say, however, that we are doing our utmost to keep all the men on our staff employed, even on short time, and we hope that business will not fall to such an extent as to necessitate closing our plant.

We think that under present conditions it is the duty of all British subjects, and more particularly of all Canadians, to use British made goods whenever possible.

If all your subscribers and the subscribers of other trade papers throughout the Empire would do this, the factories of Canada and of the British Empire in general would be kept busy and much distress would be obviated.

Yours truly,
Pease Foundry Co., Ltd.

In view of the fact that most of our manufacturers are endeavoring to keep their factories running, it is the bounden duty of every sanitary engineer to strain every nerve in getting after business. We as a class have been too apt to wait for customers turning up, but it is surprising what scope there is if we only "dig in" and "dig up" after new business. Therefore it is up to every sanitary and heating engineer to see to it that factories are kept running. They and they only can save the situation.

Overhead Runway.

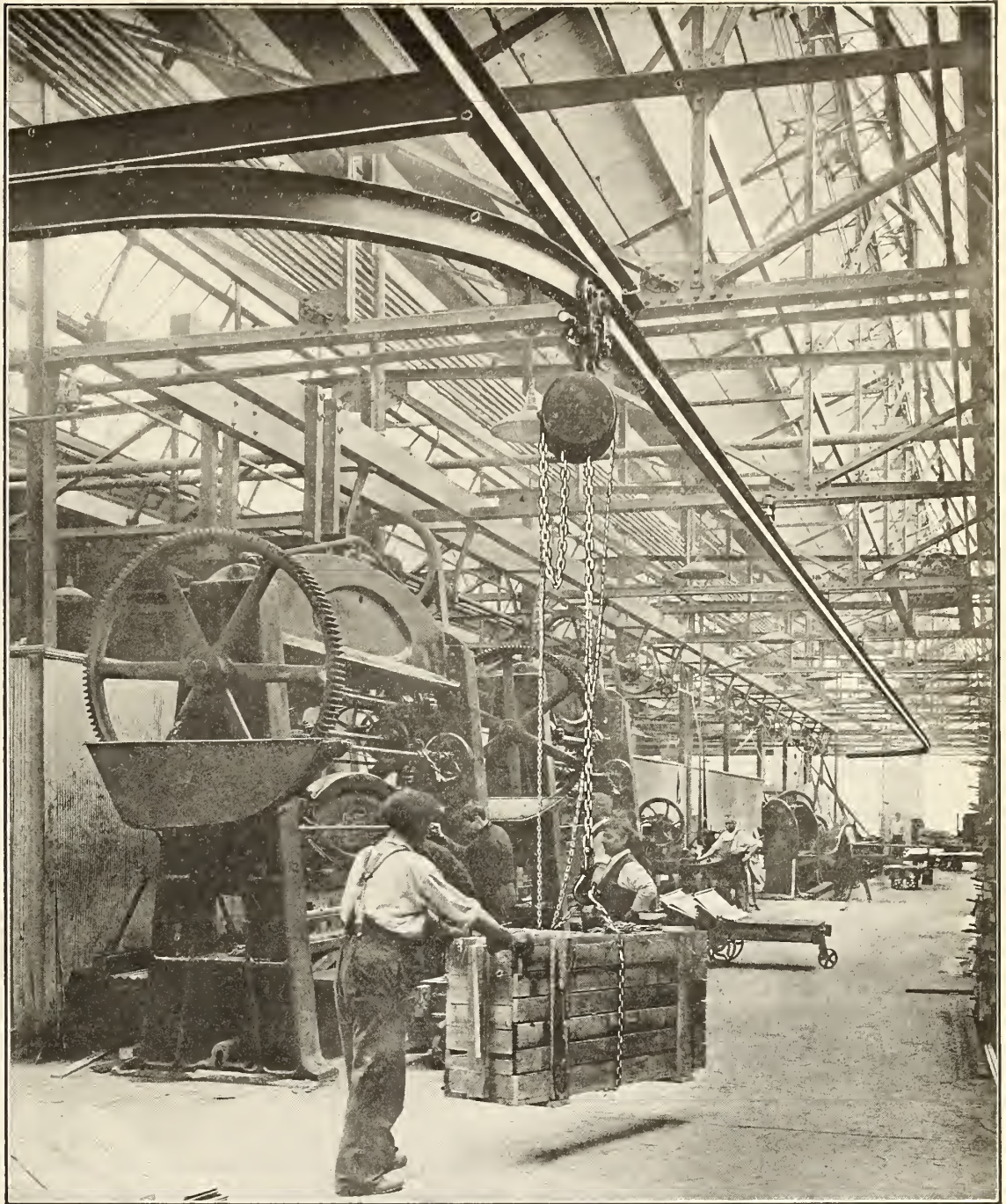
The whole of the plant is served by means of an overhead runway, supplied and erected by the Herbert Morris Crane & Hoist Co., Ltd., Toronto. Sections of the runway are carried over the railroad sidings in the form of swing jib cranes, so that a load can be picked right off the car and taken into the warehouse at one handling. Morris chain blocks and trolleys run over the whole system, and will carry cases, bales, bars and other supplies up to a ton in weight.

An interesting feature of the runway is to be noted in connection with the finishing of the steel sash product. After the latter is completely manufactured it is taken into the paint shop to receive a protective covering. The sash is suspended by means of special two-wheel trolleys, on which it is taken to a rising and lowering section of the track, located immediately over the paint dipping tank. This section is controlled by a Morris pneumatic spur-gear hoist, which is fitted with automatic stops to prevent overwinding. A slight depression in the track beam retains the trolley in a central position during the dipping process. Afterwards the trolley with its load is run over the draining board, where surplus paint drains off. All the switches in this overhead runway are of the Morris fixed type without moving parts.

When running to full capacity about at least 500 men are employed.

Canada Metal Co.'s New Catalogue.

A very interesting and useful catalogue is being sent out to the trade by The Canada Metal Co., Ltd., Toronto. It is bristling with new goods and illustrations, all of which should be very valuable to every member of the trade. In these days, every business should be well supplied with up-to-date catalogues.



Showing the method adopted in each department for handling goods to and from the various machines.

They are the guide posts to right buying. This book may be procured free by applying to **Canada Metal Co., Ltd., Frazer Ave., Toronto.**

A meeting was held in Port Huron a few days ago between the American commission and the officials of that city.

Should the city of Sarnia be forced to erect a plant for the disposal of its sewage, it would mean the changing of the present sewerage system, and the building of a disposal plant that would cost the city many thousands of dollars.

It is pointed out here that the sewage from Sarnia has not contaminated the waters of the river much, as the Indians of the reserve use the river water,

and there has not as yet ever been any serious cases of typhoid on the reserve.

River Pollution at Sarnia.

A meeting of the International Joint Commission will be held in the city hall here on October 3rd next, when the dumping of Sarnia's sewage into the waters of the St. Clair River will be discussed by the local city officials and the members of the commission.

Off to the Front.

Lient. Dr. R. S. Ruttan, medical health officer for Woodstock, has left home to rejoin his regiment, the army medical corps now at Valcartier.

The Sanitary Engineer

Plumber and Steamfitter of Canada

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TORONTO, SEPTEMBER 8, 1914

CANADIAN NATIONAL EXHIBITION

ANOTHER exhibition is over, and a successful one too. It cannot, however, be said that the same number of visitors were present. Last year was a record, but considering that our country is plunged in war, that business as yet is far below its normal state, it could not be expected that the attendance would be as large as last year.

Speaking to quite a number of the various representatives at their exhibits, as to what they thought of the exhibition the general feeling appeared to be that it was a success. There was a larger attendance of inquirers, people who were interested in the various exhibits. There were really more earnest and prospective buyers. If the exhibition did no more than bring before the public the large array of improvements and new goods that have been perfected since the last exhibition, it was a success. Not a single exhibitor was heard to say that he would not be on hand next year while quite a large number stated that they would take a larger space and have more assistance to demonstrate their own particular line more fully.

MADE IN CANADA

NEVER before in the history of the world was it so necessary for each individual member of the community to display a spirit of patriotism as is the case to-day, no matter where that individual resides. We in Canada should not only make a point of buying our own goods, but should also cater as far as lies in our power, to the wants of other countries. We have in the past bought too many articles from other countries which could have been manufactured in our own country, and we should bear in mind that every cent we spend abroad reduces the circulation of currency at home. We should feel as Abraham Lincoln did when he said:

"I do not know much about political economy, but this I do know, that when we buy goods from a foreign country, we get the goods and the foreigner gets the money. But, when we buy goods in our own country we get the goods and we get the money."

Sanitary and heating engineers do not need to spend one cent for their supplies outside of Canada except for a mere few specialties and they can easily

be supplemented by Canadian made goods, if needs be. We wish to impress upon our readers the fact that the trouble with us to-day is that we have too much of the goods and not enough money, and if our readers will insist upon buying goods from those manufacturers whose advertisements appear in *The Sanitary Engineer*, they will find they will be better served than by buying from foreign manufacturers.

A NEW ERA IN HEATING AND VENTILATION

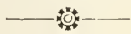
IF ONE of the most advanced authorities on heating and ventilation had stated 10 years ago that in the year 1914 we should be able to procure radiator return valves which would open to water and close to steam, that we would be able to control the temperature by the use of an ordinary thermometer, that mercury would play a most important part in raising the efficiency in hot water heating and a score of other appliances now in universal demand by heating and ventilating engineers, we should have been inclined to regard such predictions as very far-fetched. Such, however, is the case. Yet how many of us actually realize the fact.

We have installed thousands of dollars' worth of goods during the last 10 years which are costing too much to keep up. It is time we took more notice of the various appliances that are placed at our disposal and show our customers that low-priced goods and low-priced heating systems require more attention and upkeep, than those of a more reliable type. This is an age of conservation and such appliances as can be got to-day have all been brought into being, with a view of time and labor-saving as well as conservation of fuel. Smokeless boilers are a common commodity, and by their use we can have smokeless towns and cities, and thus enjoy better health. The man who will look into the merits of the mass of specialties in connection with the heating trade will not only build up a reputation for himself, but will also tend to become a public benefactor.

During the recent exhibition, the writer took the liberty of standing and listening to a conversation between a heating specialty man and a farmer. Said the farmer "And what's this apparatus used for?" the attendant replied, "This sir, is an appliance which is used on a steam boiler, and which by using our valves on the radiators, will heat your residence by steam,

requiring less than 1 lb. of steam, by the use of our system. You may set the clock, so that from 7 a. m. to say 10 p. m. a temperature of 70 degrees can be maintained, at 10 p. m., if you desire, the apparatus will then automatically adjust the damper and allow the temperature to drop down to any degree say from 70 to 50. Gradually and at a given time it will open up the draft doors and close the damper, thus raising the temperature to 70 degrees at any time desired, say 7 a. m." A whole lot more was said by the attendant while the farmer looked on in utter surprise.

When the attendant suggested, that it might seem too expensive an outfit, the farmer replied that he was not thinking of first cost, but rather of continual comfort and took a handful of literature stating that he would look into it thoroughly. This farmer is only one of the many, who, if told all the "why and wherefore's" and "thushness of things," would be installing up-to-date heating systems, and taking advantage of the new era in heating appliances.



A DIGNIFIED CALLING

HAS the great importance of our calling ever dawned upon the members of our craft? Those who visited the Canadian National Exhibition would do well to take a few moments and think of the great industry in which we are all playing a part. Sanitary heating, ventilating and lighting, was the most prominent of any industry at this exhibition.

There was a larger representation of wealth than in any other line. All the machinery brought into play to turn out the supplies used by our craft is the most expensive. Look at the millions of dollars invested in brass goods, and the same in porcelain ware, and cast iron enamelware. There is not a trade which can show such progress in so short a time as that of the sanitary heating and ventilating engineering. The mechanics employed are as a rule of a higher class than those of any other line. But unskilled labor plays the least part in producing the various goods used by sanitary and heating engineers. More skill is required in constructional work than was the case years ago. But we ourselves do not realize how necessary it is that every mechanic, or shall we say every man, should be an expert in his line.

Dr. Mackay, principal of the Toronto Technical Schools, stated not long ago, that it was astounding to see the work that is being accomplished by men in our calling, who had received such a meagre education.

But we need the education, and the actual accomplishment will not cause so severe a strain on us, as it has done in the past. Having devoted more time to study, we shall then, and then only, realize the importance of our calling, and see to it that, none but practical men be allowed to engage in work which is of such vital importance to the welfare of the human race.



COLOSSAL NERVE

THE same spirit which took the Germans to war is evidently being displayed on this side of the water by some German business houses with regard to trade. If the Kaiser has used the same judgment? tact? and foresight? in his campaign against Europe as is being displayed by one house with headquarters in New York in its endeavors to

extend the volume of its trade with Canadian firms, his defeat will be a quick and ignominious one. It seems hard to conceive the colossal effrontery of any firm pretending to do business in a business way sending a circular letter to the Canadian trade making the inference that Germany is to occupy England and the seacoast of France within six months. Here is the opening paragraph of a letter received by a Montreal firm from the Otto Schlegel Mfg. Co., from New York under date of Aug. 29:

"Dear Sir:—

Owing to war conditions and the absolute certainty that no Yellow Schlag Metal or even Composition Leaf in books will come from Germany (the only place where it is made) for *at least six months or until the German Army has occupied England and the seacoast of France*, we offer to you for immediate acceptance some of the remainder of our stock, laying at our office in Montreal, consisting of the following:"

The Montreal firm which received the particular letter which has been shown to Hardware and Metal has been placing orders with this firm for considerable amounts, but the statement was made that they would go without altogether before they would buy in the same quarter again. The communication was quite obviously multigraphed and was no doubt sent out in considerable numbers.—From Hardware and Metal.



BUSINESS AS USUAL

ALARGE number of Canadian firms have adopted the "Business as Usual" slogan, and neatly printed cards bearing the slogan may be seen in many hardware and metal merchants' offices.

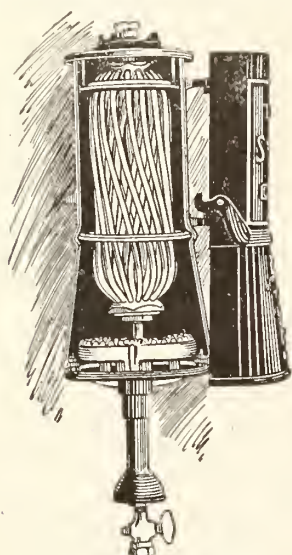
Canadian firms are endeavoring to adapt themselves to present conditions and as far as possible conduct their business as usual. During the early stages of the war there was a panicky feeling on the part of some men in the trade, but it is rapidly disappearing and all eyes are turned toward the silver lining to the cloud. A recent issue of the English Ironmonger in referring to the slogan "Business as Usual," said:—

Almost every trade and industry has had this catch-word dinned into its ears during the past week, and in many cases it has proved most helpful in checking the tide of panic which showed signs of setting in when war broke out. Some firms took fright at the mere thought of war and hurriedly discharged their staffs and closed up their works. Within a fortnight they were compelled to admit that they were panic-stricken and that the works might re-open with advantage to all concerned. Quite a number of firms, however, have been compelled to shut down. It is also evident that there are many concerns which deprecate the "business-as-usual" motto because their normal share of orders is not rolling in at the front door. To all such firms the advice given by a prominent advertising man to go out and seek business may be commended. For a time, at any rate, that advice is applicable to the electrical trader and ironmonger. He must see how his particular business can be adapted to the needs of the moment and how any local opportunities presented by the crisis can be turned to account. If he sits in his shop and wrings his hands he will get nothing.

New Sanitary and Heating Goods

STACK GAS WATER HEATER.

The James Morrison Brass Mfg. Co., Toronto, recently completed the purchase of the Canadian patent rights to manufacture the Stack Gas Water Heater. The makers claim that an examination of the Stack Heater will show a coil that is a distinct departure from the spiral or wound copper coil. The heater is substantially constructed, the



Stack Water Heater.

tubes being 5-16 inch twenty gauge seamless copper tubing, very soft and tough allowing of a free expanding and contracting due to rapid and severe changes of temperature under operation.

The style 2 Stack Heater, which is the regular standard size, contains forty-eight lineal feet of tubing, and an actual area of 1.82 square inches through the coil. The difference in area of the circulator supplying heater and from heater to boiler of three-quarter inch pipe, is significant. Within twenty seconds after the burner is ignited the circulation is started. The quickness of circulation is said to overcome the possibility of the coils becoming annealed due to overheating of the water and the consequent pitting of the lower section of the coils from this condition, and also has a tendency to scour the coils out, preventing the liming of coils from hard water condition. The makers claim that the Stack heater absorbs the highest possible amount of heat units from the gas in the heating of water under circulation. The coils are securely built up. At the top and bottom is a cone-shaped drilled manifold into which the tubes are forced then riveted similar to a tube in a steam boiler, the manifolds first being securely fastened together by a torsion

rod, which is for the sole purpose of overcoming stress at time of installation from plumber's wrench, etc. The coil upon being all assembled, is given an application of tinning compound which covers the manifold and coils at top and bottom for about two and one-half inches, overcoming the action of condensation or sulphuric acid deposit carbon from eating away the copper and destroying the usefulness of the heater.

The heater is made to operate on both natural and artificial gas. Special tubing is used for heaters going to sulphuric gas districts, where ordinary copper tubing would be very short lived. The heater has a burner capacity of fifty-five cubic feet of gas per hour, and considering the service rendered it is said to be the consumption of gas is remarkably small.

SANITARY UNDERGROUND GARBAGE RECEIVER.

Jones & Hammond, 77-79 Newborn avenue, Medford, Mass., are offering the Canadian trade a sanitary underground garbage receiver that will not freeze in winter, and that is said to be odorless in summer.



Sanitary underground garbage receiver.

It sets level with the ground and has castings made from extra machine iron. It is easily operated and the company claims that it should last indefinitely.

The pails which fit into the underground garbage receiver are made of heavy galvanized iron furnished with bails and special brass hangers which prevent the pail resting on the ground.

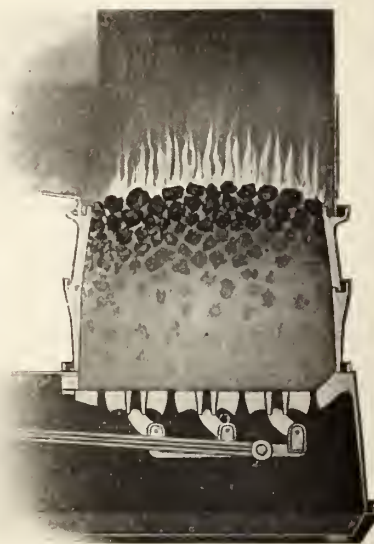
The receivers are made with and without a foot trip for lifting the cover and

with pails 14 x 23 and 18 x 25 respectively.

The accompanying cut illustrates the garbage receiver.

FURNACE IMPROVEMENTS.

The Pease Foundry Co., Ltd., Toronto, have made some improvements to the Pease "Economy" furnace, "700



Pease "Economy" Firepot.

Series," this year. The accompanying illustration shows the Pease Economy "700 Series" firepot absolutely straight on the inside from the centre down while the upper part tapers slightly inwards from the centre upwards.

In this way the heat rays from the burning coal strike directly on the overhanging surfaces which gather and distribute every unit of heat possible.

This firepot, it is said, cleans itself easily and completely every time the grates are shaken and there is no waste of heat.

The Pease "Economy" 700 Series firepot is on the same principle that has been so satisfactory and successful in all Pease "Economy" furnaces. It is made in two sections, which fit one on top of the other with a cup joint. This prevents cracking.

Large clean-out doors have also been placed on the furnace and are said to be a wonderful improvement and convenience and are situated one on each side of the feed door—thus enabling one to clean out the furnace in a few minutes at any time and without any trouble, by simply opening the doors and inserting the brush, no matter whether the fire is going or not.

Provision has also been made for connecting a domestic water tank to the furnace, so that at any time the connection can be made without taking down the furnace or drilling any holes. On the left-hand side of the feed door, space is provided with two holes, properly capped, capped, in the casting for the flow and return pipes. Copper bearing steel is used in the radiators of the furnace.

A new booklet on the subject has just been issued and will be mailed on request.

New Pumping Machinery.

One of the most interesting features at the exhibition was that of a little pumping unit made by the General Machinery Co., Ltd., 22 Mulock Ave., Toronto. This apparatus is not only simple, but is also effective. There are three things which manufacturers of pneumatic water systems are doing every day in the year and these are, to increase efficiency, durability and longevity of their products, and to see the



PORT ARTHUR AND FORT WILLIAM SANITARY ENGINEERS' PICNIC.

1. A. Cameron and "Wig" Willson. 2. Geo. Clarke. 3. "Mut" Polen, E. Steadman, A. Cameron, A. Berg, "Bud" Smith and little boy Berg. 4. Top row—Messrs Little, Logan, Haywood, Brittain, Clarke, Smith, Dennis, Johnson. Bottom row—Mrs. Logan and son, Mrs. Dennis, Mrs. Bennett, and Miss Bell.

ther particulars about this pump may be procured free by writing to the above company.

Dickson Automatic Wrenches.

If there is one tool more than another that sanitary and heating engineers are interested in, it is a good wrench; pipe wrenches as well as nut wrenches. The Dickson wrench has some very notable changes in its makeup, which will no doubt appeal to the trade. Every person who has not seen this wrench will do well to write at once to the manufacturers, the Canadian Tool Steel Co., 506 Lumsden Building, Toronto.

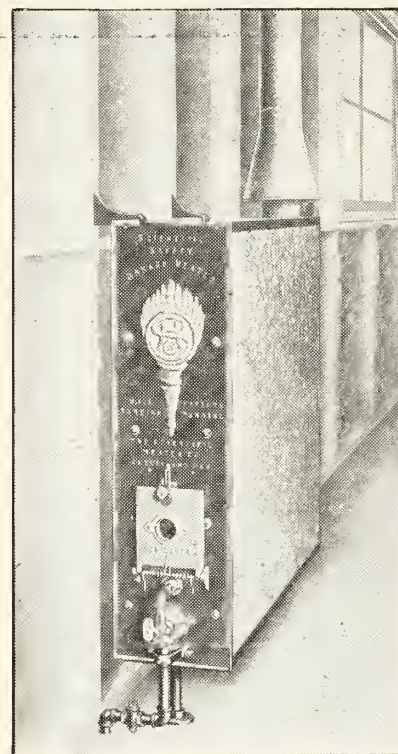
Cutting Down Expenses.

We know a man who had a 2-inch pipe, which he allowed to run free for a part of the day. He wanted to cut down the delivery one-half, so he ordered a sanitary engineer to substitute a 1-inch main. Then he wondered what was the matter, insisted that the pipe was clogged, choked, or something. He did not know that in doubling the diameter of a pipe the capacity increased four times—and working backward cutting the diameter in two, decreases water supply three-quarters. If he had left that problem for the sanitary engineer to attend to, just as the sanitary engineer leaves the matter of printing to him, he would only have had to pay one bill instead of two.

New Garage Heater.

One of the novel exhibits at the recent Canadian National Exhibition was that

of a garage heater. This heater is now being handled by the Bowie Jamieson Co., Ltd., of Hamilton. Several interesting claims are made for this heater,



Garage Heater.

which is specially designed for heating a garage. Further information may be procured by writing to the above company.



Special No. 21 in operation.

way the G. M. C. special No. 21 in action was a treat. "It is so simple," was the exclamation heard from time to time by those who saw it working. Any fur-



Exhibit of The Standard Ideal Co., Ltd.

THAT Canadians should not and do not have to go out of their country for Bath Tubs, Lavatories, Kitchen Sinks, etc., was emphasized by the beautiful display of Sanitary Enameled Iron Ware Fixtures by the Standard IDEAL Company, Limited, of Port Hope.

This display of Sanitary Fixtures was one that Canadians should be proud of, and if the remarks made by our American Cousins (a great many of whom visit the Toronto Exhibition), may be taken as an indication of the advances made by this Canadian Concern, then the United States Manufacturers of Sanitary Fixtures may well feel envious. As one American Visitor said:—

"I have been associated with the Plumbing Business in the United States for a great many years, but I have never seen anything that equals this display."

It may interest our readers to know that previous to the establishment of the Factories of the Standard IDEAL Company, Ltd., the sale and distribution of Sanitary Enameled Iron Ware in Canada consisted chiefly of defective ware (so-called "Seconds"), from the American Manufacturers. The Canadian Market of that time was a dumping ground for inferior and defective American goods.

The market thus created presented many difficulties to any new concern with high ideals, attempting to manufacture and sell its product on the basis of quality and not price.

That quality is always finally appreciated is best borne out by the fact that the policy adopted by this Company, of selling only first-grade goods, has practically succeeded in driving Seconds from the Canadian Market, and has created a condition that insures the Home Builder of securing what he purchased, i.e., an honest article.

The "Victor Bath" installation, consisting of three tiled-in Enameled-all-over "one-piece" Fixtures, came in for a great deal of favorable comment. This is the type of bath the Company recently installed in the new Vancouver Hotel being built by the Canadian Pacific Railway Company at Vancouver. Almost 200 of these fixtures are installed in this new Hotel Palace.

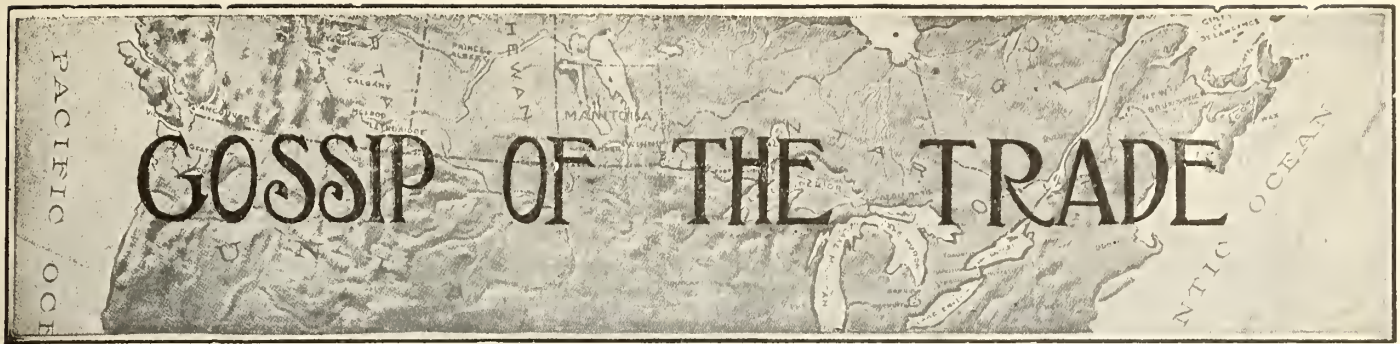
The same Company also equipped the rear addition to the Royal Alexandra Hotel at Winnipeg with 150 of the "Interchangeable" Panel Type Baths. This certainly speaks volumes for the quality of the Canadian-Made Goods, and Canadian loyalty.

A great many of the ladies (whose principal troubles of the week are on Monday), were tremendously interested in the new Hercules Laundry Tray. This article was designed as a cheap, durable Sanitary Enameled Cast-Iron Laundry Tray to take the place of the brittle, water-logged, unsanitary cement tray.

It also possesses the unique feature of having a "cast-in" wash board. This saves the expense of the old-fashioned separate wash board, which, aside from its inconvenience, is extremely unsatisfactory in that it must be frequently repaired or replaced. In the Hercules Trays, the wash board is there forever.

As a whole, the quality of the display made by the Standard IDEAL Company is indicative of the wonderful progress made by the Canadian People in the last ten years, in all branches of business. Canada has just as much brains and energy as any other country. Let the public, therefore, encourage the men who are investing their capital and their undivided efforts in building up this great, new country, by buying goods "Made in Canada."

The Standard Ideal Company is keeping its Factories running as usual during the present crisis.



MUELLER EMPLOYEES' ANNUAL PICNIC.

The employees' Aid Society of the H. Mueller Manufacturing Company, Limited, held their second annual picnic at Tashmoo Park, on Saturday, August 15. The boat left Sarnia at 8.05 a.m., returning from Tashmoo Park at 6.20 p.m., Sarnia time, and it proved to be "some" picnic. It was a regular "All Comers'" picnic. The society chartered the steamer "City of Toledo" all to themselves.

There was such a large list of sports to take place that quite a few of the

- 4—100-yard race for single men.
- 5—50-yard race for single ladies.
- 6—Potato race for girls under sixteen.
- 7—50-yard race for girls under 16.
- 8—35-yard race for girls under 12.
- 9—1 mile race for boys under 20.
- 10—100-yard race for boys under 16.
- 11—Men's three-legged race.
- 12—15-yard race for children under 5.
- 13—Peanut race for boys and girls.
- 14—Smoking contest.
- 15—20-yard race for children under 8.
- 16—Egg race for ladies.

"Hesitation Waltz." Suitable prizes in each event for both lady and gentleman.

And as the Irishman said, "Everybody in the crowd got a prize except those who didn't, and there was quite a big crowd of the few who didn't." One thing, however, could be said and that is, no prize returned home without an owner.

The prizes were generously donated by the tradesmen of Sarnia as follows—G. G. Ingersoll, Watson Bros., Wm. Storey, R. T. Geary, Callum & LeSueur, Alex. Joss, Phippen & Simpson, W. C. Palmer, R. Glynn, G. Wenino, R. McKnight, W. J. Proctor, Jas. Fraser, Mills Bros., D. McGowan, J. C. Barr, E. P. Battley, McDonald Bros., J. Knowles, J. Mackenzie, George Reeves, Wm. Kennedy, Stanley Williams, J. D. Mills, A. Rose, Sarnia Cigar Company, F. W. Woolworth Co., Victoria Sweets, D. C. Jamieson, Geddes Bros., James Galbraith, W. J. McIntyre, H. W. Fry, W. J. Parsons, Thos. H. Manley, R. T. Laughlin, Clement Drug Co., Newton Bros., A. J. Johnston, R. H. McMann, W. E. McKelvey, W. B. Clark, George W. Dwyer, Alex. Mackenzie, N. D. Rougvie, Mackenzie, Milne & Co.

An able committee was appointed to see that every phase of the event was attended to. These committees consisted of the following:

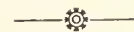
Reception Committee—E. W. Allen, chairman, G. P. Harry, C. W. Padgitt, R. Lau, Brock Palmer, J. Simmons, A. Carroll.

Athletic Committee: Baseball—J. Jeworoski, chairman, T. E. McMann, C. W. Barber. Field Events—Richard Lau, chairman; H. Bennett, W. Yates, J. Burkam, F. Powers.

Prize Committee—Richard Lau, chairman; J. Simmons.

Publicity Committee—F. L. Riggan, chairman; G. P. Harry.

Dancing Committee—C. G. Heiby, R. S. Thrift.



Edmonton Sanitary Engineers Discontinue Business.

On July eleventh the sanitary engineers branch of the builders' exchange decided to close their places of business (Continued on page 34.)



Some of the champions, who hold up the dignity of the Mueller Mfg. Co., Sarnia, whether at work or play.

events were dispensed with on the boat, which proved even more interesting on account of the orchestral music accompaniments. All the local sanitary and heating engineers were guests as well as several of the city officials. The day was fine and everything went off without a hitch, which to say the least is typical of the whole "Mueller crew." The following is a list of the various games, etc., which were pulled off — "some pull":

- 1—Baseball game.
- 2—100-yard race for married men.
- 3—50-yard race for married ladies.

- 17—Men's shoe race.
- 18—Ladies' shoe race.
- 19—Sack race.
- 20—Tug of war.
- 21—Mule contest for ladies.
- 22—Boy's race under 12, 25 yards.
- 23—Pie eating contest.
- 24—Blind-folded race for married ladies.
- 25—Cracker eating contest for ladies.
- 26—Oldest lady and oldest gentleman.
- 27—Grand prize drawing.
- 28—Prize dancing contest, open to all Mueller employees and guests. First event: "One Step," Second event:

A New Course in Sheet Metal Work

The Sanitary Engineer Secures the Services of an Expert to Supply a Complete Course—Articles Will Appear in Each Issue of The Sanitary Engineer.

THE Sanitary Engineer has been making a very exhaustive search for some time to secure a first class sheet metal worker, who could prepare a special, yet simple course on such work. At last we have been fortunate enough to secure the services of Charles Seivers, of Ottawa. Mr. Seivers is nothing if not practical, and is at present the manager of one of the largest and most up-to-date sheet metal and tinsmiths' shops in Canada, where jobbing only is a specialty.

Readers who have any knowledge whatever of sheet metal pattern development will see at a glance that a man employed at such a shop will be likely to have a greater actual knowledge of the trade than one who is employed in a factory. Mr. Seivers is at heart a sheet metal worker. He has worked himself up from helper to his present position, first engaging at the work in the year 1896. Thus he has now had 18 years' practical experience.

In the course of the negotiations, Mr. Seivers stated "That he would advise a course as simple as possible, free from highly technical phraseology and written so that either man or boy who has had a limited education could read and understand it."

We have already submitted several

articles to one of the highest authorities on sheet metal work in Canada, getting the opinion that the course would prove a boon to every man in the trade who took an interest. It will be as simple as possible, but, if perchance any readers are a little in doubt about any portion of the course, Mr. Seivers will be only too glad to take such matters up, and to make fuller explanations.

This course has one great advantage over most courses in pattern development. Each article will be separate in itself. The information contained will be the result of every-day practice.

Mr. Seivers takes a particular interest in his "boys," because he can see that the tradesmen in his line are becoming more like machines than practical mechanics.

For instance, how many of the men who have worked at the trade several years can actually develop a set of elbow patterns? The writer knows of quite a large number of men who have worked as long as ten years and cannot develop such patterns.

Therefore, Mr. Seivers will see to it that the course will be simple and at the same time as practical as possible. The first article of this course is appended.



Charles Seivers.

ARTICLE I.

Article I.

In dealing with problems in sheet metal pattern cutting, a number of terms or names are used for the different operations, some of which may at times leave doubt as to what is meant by them for the purpose of making these clear we deal in this issue, in some definitions from Euclid's elements, or as more generally called geometry.

A Line; a Straight Line

A line has position, it has length, but neither breadth or thickness, a straight line is defined as the shortest possible distance between two points.

A Point.

A point has position but not magnitude. In Fig. 1, A-E and D-C are straight lines, and the ends of the lines and the intersection or point where they cross each other are called points as A B-C-D and E.

A Curve.

A curved line or a curve is a line of which no part is straight as A-B-C in Fig. 2.

An Angle.

Two straight lines drawn from the same point form an angle. As B, A, C in Fig. 3, the straight lines are called the arms of the angle and the point is called the vertex.

When a straight line stands on or is drawn from another straight line, making the angle on either side equal to each other, each of the angles is called a right angle. As in Fig. 4 if A-B is drawn from C, D so that the angles A-B-C and A-B-D are equal to each other, these angles are right angles and A-B is drawn at right angles (or as called in general practice, square width) to C-D.

An Obtuse Angle.

An obtuse angle is one that is greater than a right angle as at A in Fig. 5.

And an acute angle is one that is less than a right angle as at B in Fig. 5.

Parallel Straight Lines.

Parallel straight lines are such as are in the same plane but being continued out either way do not meet. In Fig. 6 we have two lines parallel to each other, as A-B and C-D, these if drawn out would be the same distance apart and would not meet.

A Circle.

A circle is a figure contained by one curved line, which is called the circumference and straight lines drawn from a certain point within the figure to the circumference are equal to each other. This point is called the center of the circle.

A Radius.

The radius of a circle is a line drawn from the center of a circle to the circumference.

(Continued on page 34.)



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

Trouble With Automatic Damper Regulator.

Editor Sanitary Engineer: — Last winter I was called in to put new rubbers in an automatic damper regulator, and though I bought the very best sheet rubber, the washers did not last long. I am enclosing sketch of it. Can you please show me what the trouble is? My customer states he has always had trouble with it, but more so during last winter. One peculiarity is, that when the boiler was first put in, it was extra large, so as to allow for additional radiation. The steam carried before the additional radiation, was about $\frac{1}{2}$ a lb. Now it is necessary to carry about 2 to 3 lbs. Has that anything to do with the washers wearing out and bursting?

A. Fitter, Quebec.

Replying to our correspondent, and at the same time reproducing his sketch, we may state, that in the first place, the regulator is not fitted up properly. It is no wonder that the washers blow out. During the first period, when there was only $\frac{1}{2}$ a lb. of steam pressure required, there would not be the same strain on the washer. There would not be as high a temperature of steam against the washer either, and further, when a greater head of steam was required, the balance weights, which are necessary to counterbalance the doors would need to be heavier, or moved further along the regulator lever, causing a greater strain on the washers. Then again, possibly when you replaced the rubber washer, you used pure rubber. This should not be used for such a purpose. The proper material is 2 ply rubber insertion of a good quality. This is a sheet rubber with two ply canvas in it.

It will be seen by looking at our correspondent's sketch, fig. 1, that the regulator is fitted above the water line,

and has no pocket to hold water in, thus allowing the steam to come in contact with the washer. It is this that is causing the washers to wear out, along with the heavier balance weights required, or having moved the weights down the lever as the case may be. Fig. 2 shows how all damper regulators should be fitted on steam boilers. Fig. 3 shows a slightly different form of damper regulator, which is generally supplied with domestic heating boilers. Fig. 3 also shows how the chain may be attached, when there happens to be some obstacle in the way of the long lever, or when the boiler is too large to allow the rod or lever to extend to the rear of the boiler.

NOT A VERY BAD LETTER.

There are Fortunate and Unfortunate Aspects About Letter "e"

Someone has advanced the opinion that the letter "e" is the most unfortunate letter in the English alphabet, because it is always out of cash, forever in debt, never out of danger and in hell all the time. For some reason, he overlooked the fortunes of the letter, as we call his attention to the fact "e" is never in war and always in peace. It is the beginning and end of existence, the commencement of ease and the end of trouble. Without it there would be no meat, no life, no heaven. It is the centre of honesty, makes love and marriage perfect and without it there could be no editors, devils nor news.

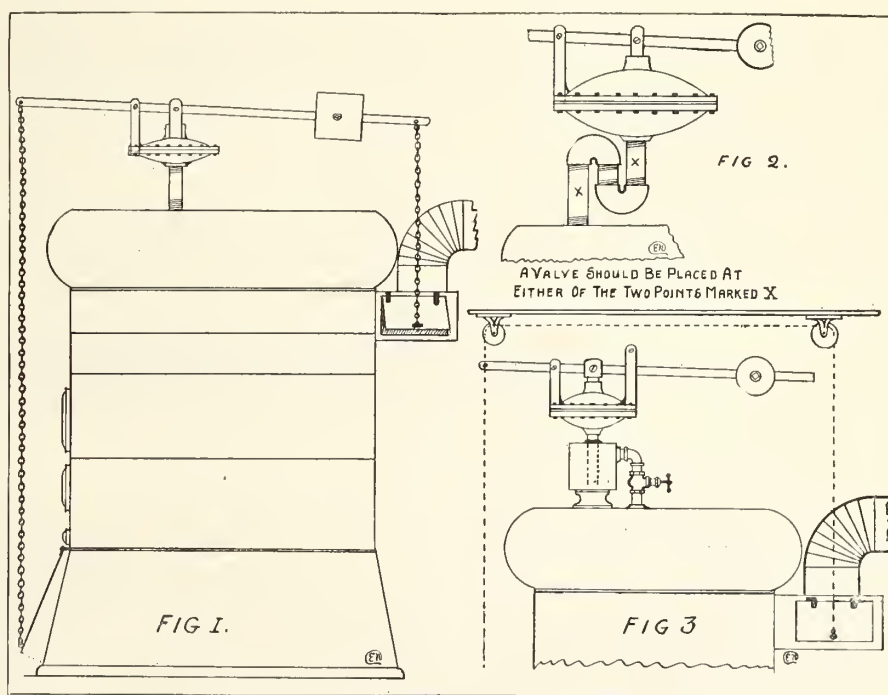


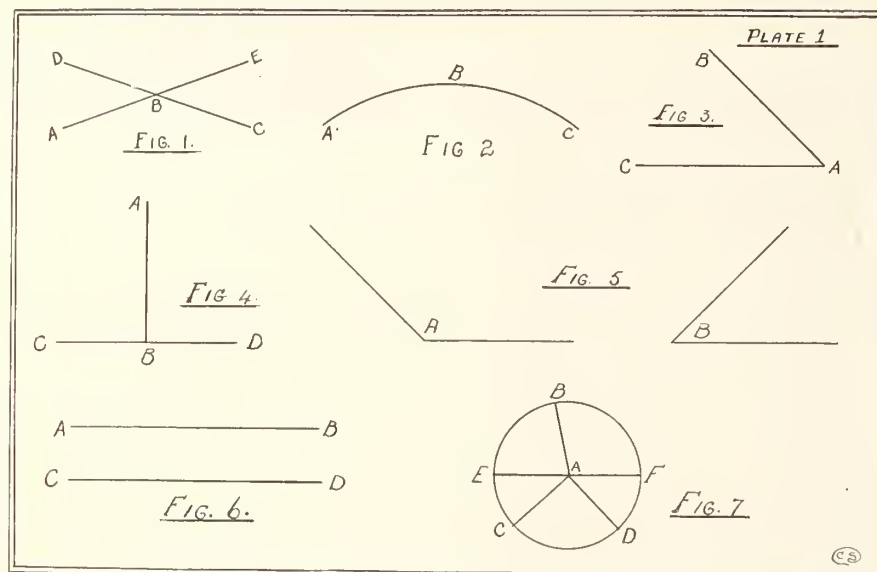
Fig. 1. Our correspondent's sketch. Figs. 2 and 3. Proper methods to adopt when installing a damper regulator.

NEW COURSE IN SHEET METAL WORK.

(Continued from page 32.)

The Radii.

In Fig. 7, point H is the center of the circle B-C-D, the straight lines A-B-A-C, and A-D are each a radius of the circle B-C-D, and if spoken of together are called the radii of the circle. The straight line E-F is a diameter of the circle B-C-D.



A Diameter.

The Diameter of a circle is a straight line drawn through the center of a circle and ending both ways at the circumference.

EDMONTON PICNIC.

(Continued from page 31.)

for the day, and hied themselves to the shady shores of Wabanum Lake, where they held their annual picnic and games. The day was an ideal one for the outing, which was enjoyed by a large number of plumbers and their families.

A very exciting ball game was on the programme, the opposing forces being the sanitary engineers and the master plasterers. The game, which was won by the S. E.'s by a score of 47-53, gave the spectators no end of thrills. Home runs being the feature of the game. Harry Nash was credited with no less than eleven. Batteries for the S. E.'s were: Pitcher, P. Freeze, while Chas. Frost operated behind the bat. Harry Baston refused to run the bases, so they had to put him on roller skates. In trying to steal home he lost a wheel, and was out by a whisker.

Wheelbarrow Race.

Amongst other sports was a wheelbarrow race, which Treasurer Bill Carse nearly won. Bill should use a stronger barrow.

The fat man's race was won by Frank McKnight in the fast time of 9½ "min-

utes" flat. Frank says that if his competitors had used self-starters they might stand a show. Geo. Richardson made a valiant attempt to beat Frank out but was unsuccessful, having lost his windshield.

"Fisty" Fishing Contest.

The prize in the fishing contest was awarded to Bill Carse, though he was disqualified later, as it was proven that Bill had broken into the fish market and

as far as can be seen, this letter was sent to every member of the trade.

It pointed out in very forceful terms the method of looking up expenses and seeing that these were properly charged up to overhead expenses. In a word—overhead expenses are such sums as must be paid whether the volume of business is done or not, such as:—

Rent,
Taxes,
Employer's salary,
Telephone,
Bookkeeper (if any),
Stenographer (if any),
Stationery,
Insurance,
Depreciation of plant,
Interest on capital invested,
Postage,
Car fares,
Light and heat.

and last, but not least, never forget that the invoice amount of goods does not represent the total cost, or that the time-book will give you the cost of labor, but rather invoice and time-book, plus a proportion of the items shown above.

Fortune's Ladder.

There are just six steps to the Ladder of Fortune; when you have ascended them you stand on the broad platform of success.

Self Confidence is the first step. If you do not believe in yourself, how can you expect any one else to believe or have confidence in you?

Industry is the second step, because if you are not industrious all your abilities are like the buried talent.

Perseverance is the third step. An engine which only goes by fits and starts is absolutely valueless. It cannot be depended upon. We must persevere to accomplish success in any walk of life.

This reminds us of an old Scotch lady who was never known to speak ill of any person who persevered in his calling. When one day a couple of young students who boarded with her asked her if she could speak a good word for the de'il, she replied, "Aye for shure I can. If ye laddies were halve sae sincere in gettin' to heaven as the De'il is in gettin' ye to hell, ye'd no be sae fair wrang, ye ken."

Probity is the fourth step. For dishonest success is nothing less than colossal failure.

Temperance is the fifth step. For if you become intoxicated with wine or strong drink, or create any habits of intemperance, you are sure to end on the road to ruin.

Independence is the sixth step, and when you stand upon the step of independence you can dictate to the world. You are an independent being and one who will be sought after by all.

stolen a basket of fish: stealing or buying fish being against the rules of the contest.

Pie Eating Contest.

Chas. Frost won the pie-eating contest. "This was a scream." Blueberry pie was the object of attack and Chas. looked like a Gurney smoke consumer at the finish. Dancing was indulged in during the afternoon and evening. Harry Nash had a perfect average at the light fantastic. Harry danced at least twice with all the ladies present. Harry was complaining of feeling tired the next day. Races and games were also provided for the ladies and children, for which suitable prizes were given. Every one brought an ample supply of good things to eat, to which full justice was done. The committee also supplied ice cream for the kiddies, four thousand ice cream cones being distributed during the day. It goes without saying that an enjoyable day was spent by all, due to the untiring efforts of an active committee composed of Messrs. Nash, Yale, Dossletts and Rush.

A VERY CREDITABLE MOVE.

Never was there a time more opportune than now when sanitary and heating engineers should look to their methods of doing business. Manufacturers and jobbers are doing all they can to educate those of our craft. Just recently we received a very interesting letter from one large manufacturer, and

HOT WATER

AND PROFIT

from

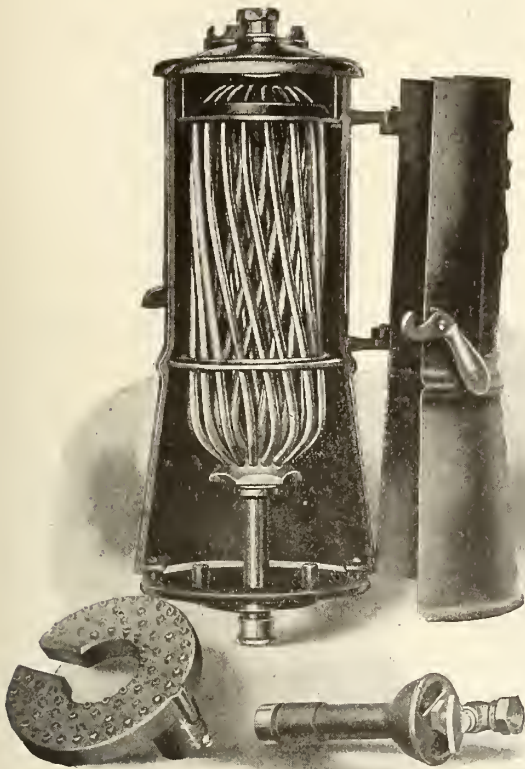
Stack Gas Heaters

They sell themselves if you put the heater where Mr. Hot-and-grimy Customer can see it, and have the price where he can see that too.

Sooner or later the suggestion of that bath in water that is "just right" will loosen up the tightest wad—it's human nature, that's all. And one sale means more, for a good article. That is where our **Stack Gas Water Heater** comes in. It's a peach for the price. One minute after it is lit, it gives hot water continuously at the tap. And it is guaranteed to produce more hot water for a given quantity of gas, and to last longer than any other copper coil heater of equal capacity, made.

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Hoyt Metal Co.,

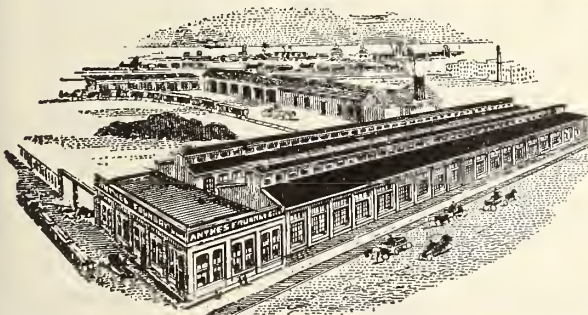
Toronto, Ont.

New York, N. Y.; London, Eng.; St. Louis, Mo.

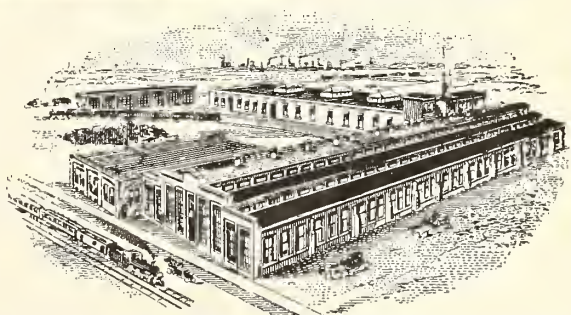


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Those who have sold and installed them and

Those who have been investigating with a view to future purchase.

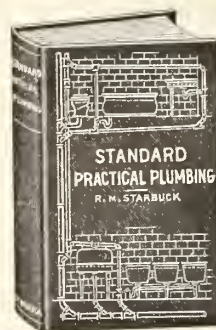
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		21A—220 Gal. Tank
		21B—315 Gal. Tank

With No. 2 Pump 200 Gal. Per Hr. ¾ Horse Power.	} SIZES {	22 —120 Gal. Tank
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will interest you

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Sani-Flush will sell quickly because it rids the housewife of the most disagreeable household task—that of trying to keep the Water-Closet Bowl clean.

While it is easy to clean the visible part of the bowl, no acid, brushing, or scrubbing will affect the unseen trap or outlet, with result that the water standing in it becomes foul and offensive.

A little of Sani-Flush SPRINKLED in the water will soon loosen the incrustation so that it washes out when the closet is flushed.

A small quantity of this white powder used every day or two will keep the closet absolutely clean and odorless.

Sani-Flush won't craze the porcelain bowl nor injure the metal pipes or fittings, but it does keep the bowl clean without brushing.

Write for full particulars.



The Hygienic Products Co.
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Name your choice clearly

Your call in either way is sure to satisfy. Both tools, thoroughly tested before their sale, are bound to supply first-class results when in operation.

"Agrippa" Chain Tools, universally good for both pipe and fittings, have plainly indicated their worthy qualities in all kinds of work. Get one from your dealer and satisfy yourself of its Single-Jaw-worthiness—trial free!

Vulcans set the pace, kept up the pace and always will keep at the pace for all Chain Wrench work.

All Tools guaranteed. A choice is simply your declaration of different working-conditions for yourself. In either case perfectly safe and good.

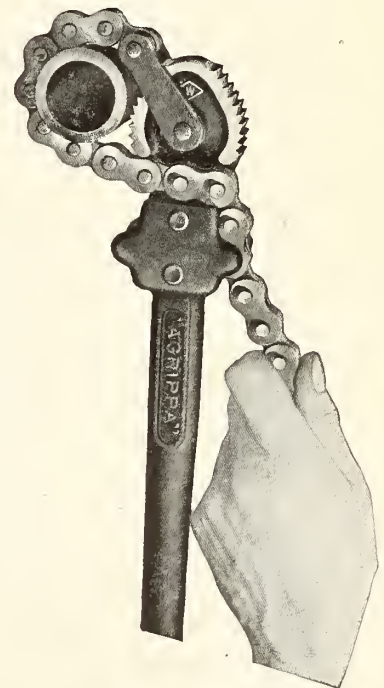
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Secure Free Pamphlet of Dependable Chain Tools.

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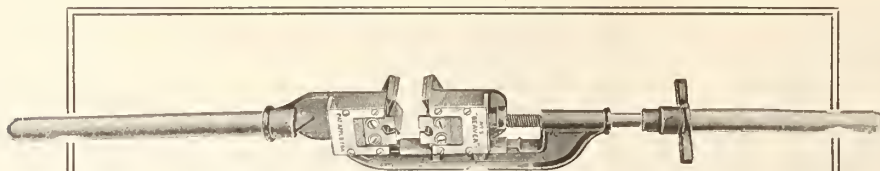
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makes work easy—and the pipe end clean and square

It is not strained by feeding too fast, because you do not feed it—simply close it up on the pipe. The feed is automatic—simply pull two handles, same as a die stock. The form of the knives regulates the depth of the cut. These are the features which make the Beaver Knife Cutter a successful, practical tool. The largest users of pipe have discarded wheel cutters in favor of "Beaver" Square-End Pipe Cutters, as all will do who try them.

Works easier and quicker than a wheel cutter, and makes a square pipe end on which threading dies start easier, last longer, and run straight. It cannot split pipe.

Let us put you in touch with users.

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Pipe Cutter

The
Borden-Canadian Co.
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End Pipe Cutter

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In buying plumbing goods you want material that is absolutely dependable—you want your patron to get the maximum of service and satisfaction at the minimum upkeep cost.

YOU will get these things beyond the shadow of a doubt any time you use

Mueller Colonial Self-Closing Faucets

These goods are unequalled in metal, mechanical principle, workmanship or wearing qualities. This is no unsupported statement—owners and managers of big buildings and plumbers tell us so.

All Mueller plumbing goods are tested under 200 pounds hydraulic pressure and unconditionally guaranteed.

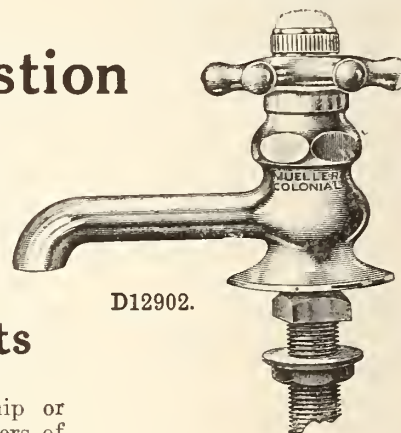
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The Bronze to Bronze at the joint means no
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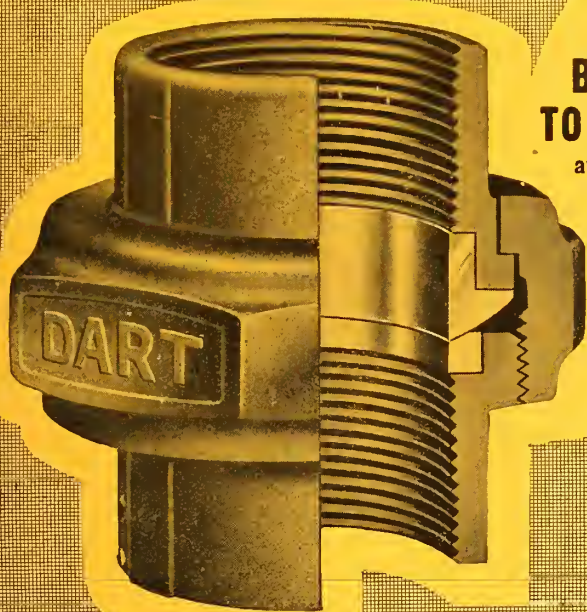
**BRONZE
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Our Trade Mark
(Your Guarantee) is
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*If a Dart is defective it will be promptly replaced
with two new ones*

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KERR GATE VALVES

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"KEYSTONE" PATTERN

Embody all the latest features



4 1/2-in. and larger

Screwed-in Seats

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Full Opening.

Large Diameter
Hand-Wheels.

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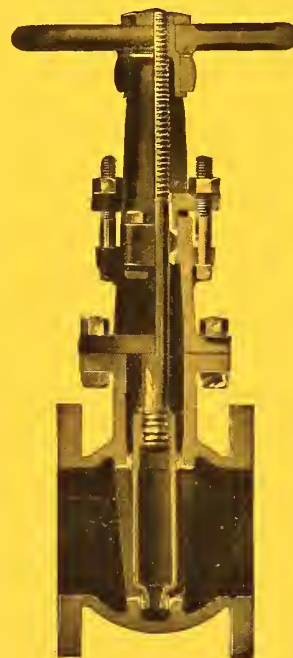
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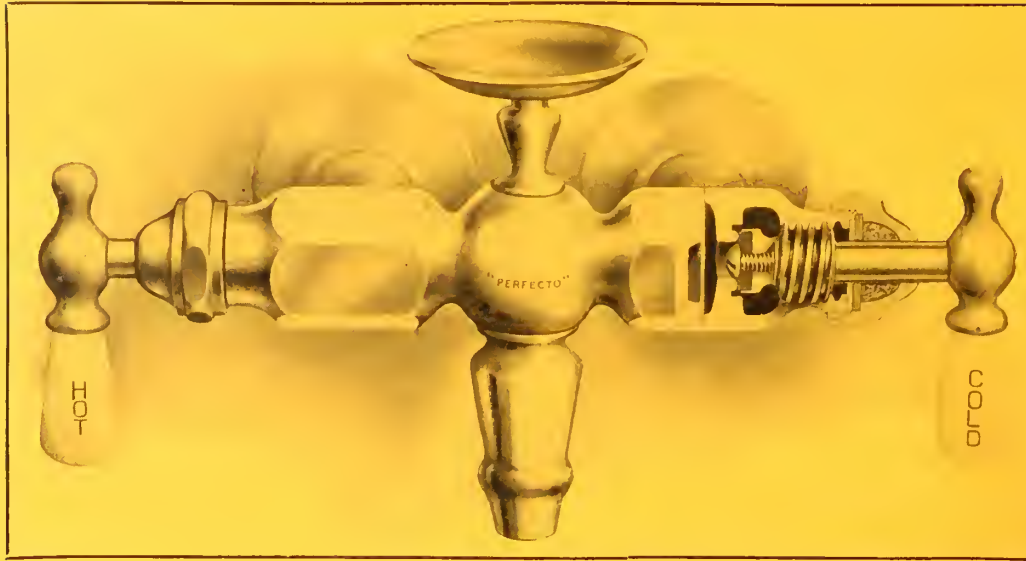
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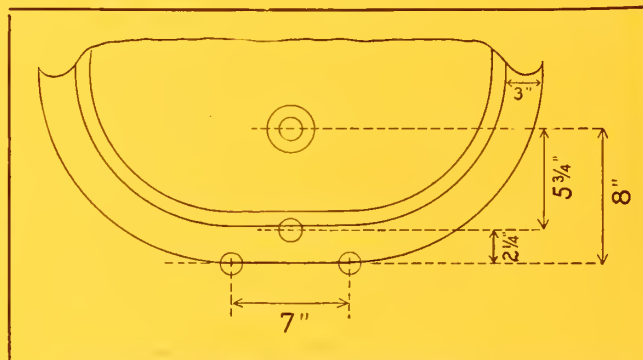
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GALT BRASS



"PERFECTO" (REG. 1913)

Use The "Perfecto" when in a hurry—
Saves half the time and all the worry.



"ROUGHING IN"



PERFECTO No 523

BATH COCK is a modern achievement in the quick-pressure or rapid-opening type, giving you lever action, and largest waterway made, coupled with a very attractive design.

COMBINATION WASTE AND OVERFLOW—Heavy cast parts, being adjustable, you have no tubes to cut, making it a great time saver.

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GUARANTEE—Same as we extend on all goods bearing our name.

SEND US YOUR ORDER NOW.

GALT, CANADA

THE
"PERFECTO"

BATH SET

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PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII

Publication Office : TORONTO, OCTOBER 1, 1914

No. 19

Twentieth Century Bathroom Booklet

Published for the Benefit of Prospective Purchasers who are unable to Make Personal Selections of Their Plumbing Fixtures.



THESE BOOKLETS ARE FURNISHED FREE OF CHARGE TO LICENSED PLUMBERS.

This Booklet contains much valuable information and many suggestions of interest to prospective purchasers. It will give them a better idea of the various styles of fixtures obtainable, and will enable them to make a more intelligent selection of the fixtures best suited to their needs.

We have a limited quantity on hand and will be pleased to furnish a supply on receipt of request written on your business letterhead.

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THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.

These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

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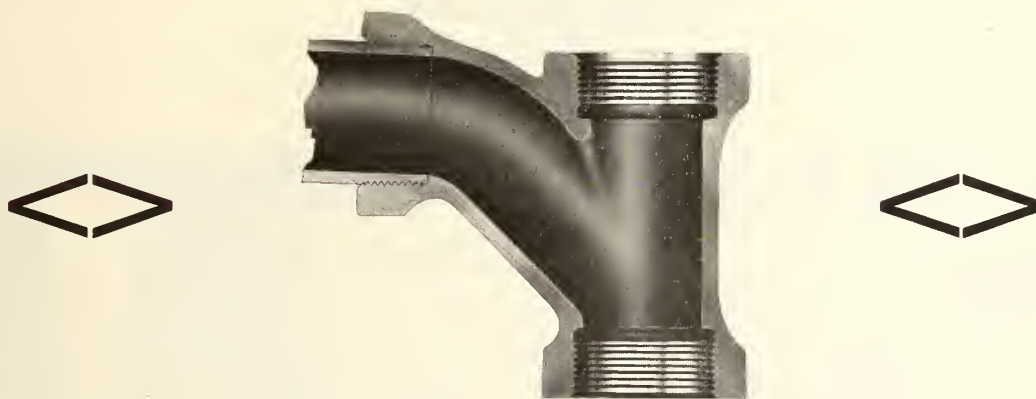
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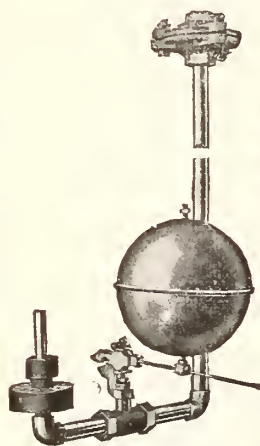
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Cellar Drainer



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Double Plug



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“CLIMAX” plumbing specialties are the result of years of experience, and can be relied upon to work when wanted, to do the work they are severally made for doing, and to do it always to the complete satisfaction of the user.

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THE DAISY BOILER

Over 55,000 DAISY Boilers

are giving the best of service throughout Canada.

The Daisy has qualities which make it a better proposition than any other on the market.



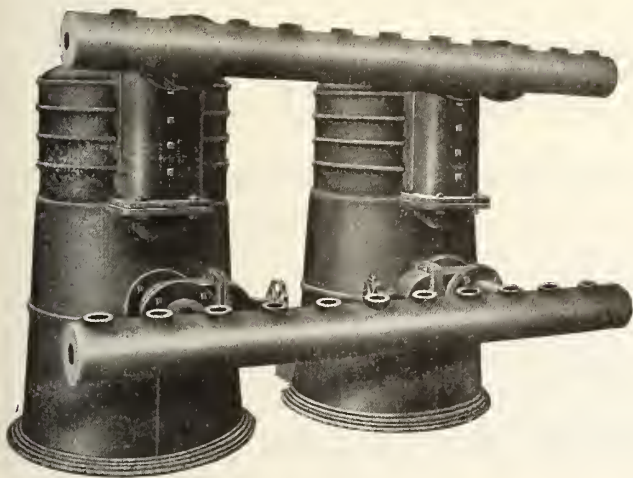
Made in the best equipped plant in Canada.

Without doubt the most popular boiler made.

Every installation means another customer satisfied.

Minimum consumption of fuel.

Maximum amount of heat.



Rear view of two Daisy Boilers connected with twin headers. This system gives great satisfaction in mild and extreme weather.

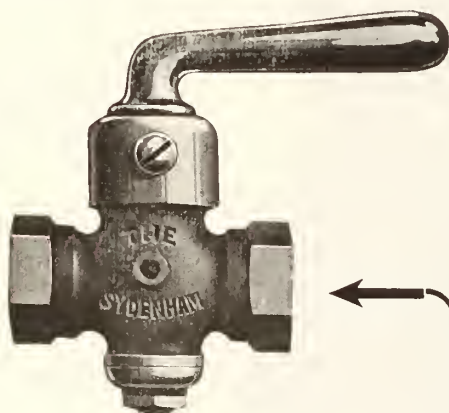
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If you want Ground Key
Stops and Stop and Waste
Cocks that will give entire
satisfaction to yourself and
customers the

SYDENHAM
BRAND

will supply your need.

Extra Heavy.

Made of virgin metal.

Every piece guaranteed.

Sold by leading Jobbers.

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**THE WALLACEBURG BRASS & IRON
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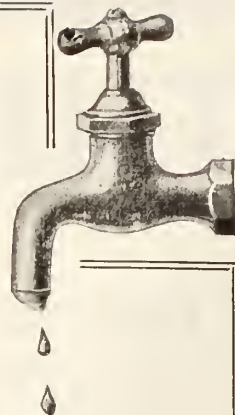
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means
money wasted**



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faucets spells expense, delay and
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Eventually their complaints and
dissatisfaction cause you to lose
more than you gain by renewing
washers and making repairs.

Build your business on the firm
foundation of satisfaction and
service to your customers and
profit to yourself. Install the

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No washer needed. No complex parts. A conical
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or splashing. High-grade materials and workman-
ship throughout.

And here is our GUARANTEE: Every J-M Wash-
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If it fails to give satisfactory service in ordinary use
during that period a new seating will be supplied
FREE.

**Write our nearest Branch for Booklet
and Special Proposition.**

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H. W. JOHNS-MANVILLE CO., LIMITED**



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300,000 lbs.

carried in stock for immediate
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Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

Brass and Copper Rod.

Brass and Copper Sheet.

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FORMER RESIDENCE OF THE LATE QUEEN VICTORIA OF ENGLAND



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"Standard Sanitary" Plumbing Fixtures can be obtained anywhere in the Dominion. They are handled by leading Plumbers throughout the provinces and are carried in stock by Jobbers and Sales Agents throughout the Dominion of Canada, thus facilitating prompt deliveries.

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COMPRESSION BATH COCK

Fuller Pattern—China Index Handles



As easy to operate as a regular Fuller.

Note:—Beauty of design and construction.

The handsomest and best bath cock on the market.

Furnished with brass handles also if so specified.

Made in Canada.

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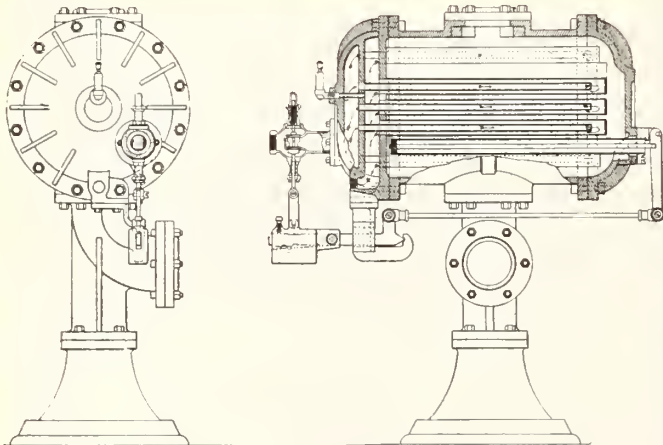
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Canadian Wolverine Company, Limited
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The "Manny" Heater

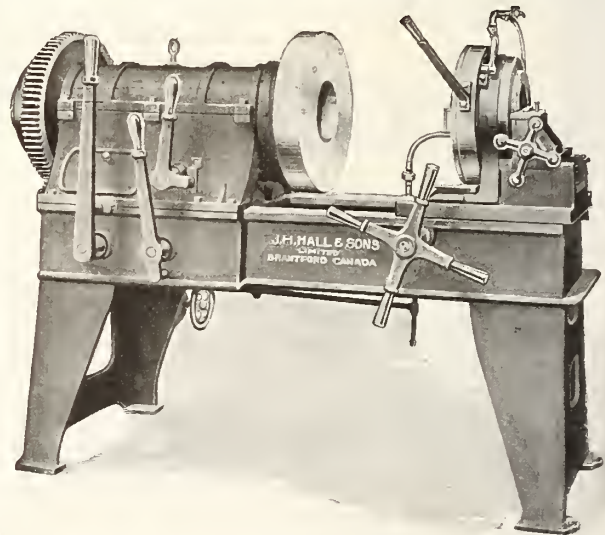
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The Manny Heater is connected to a hot water system as the ordinary hot water furnace, and steam is carried to it from a boiler house stationed outside the main building, at regular boiler pressure, but reduced at every heater by a steam pressure reducing valve to 20-15-10-5 lbs., or as low as one pound to the square inch, according to temperature required in the building. The steam is carried to the Manny Heater from the boiler room through underground pipes. There isn't a better or more economical way of heating large buildings. Many furnaces can be eliminated and much space saved. Supplied with or without Thermostats. Notice how provision is made for the expansion and contraction of tubes—Threaded Joints.

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[MADE IN CANADA]

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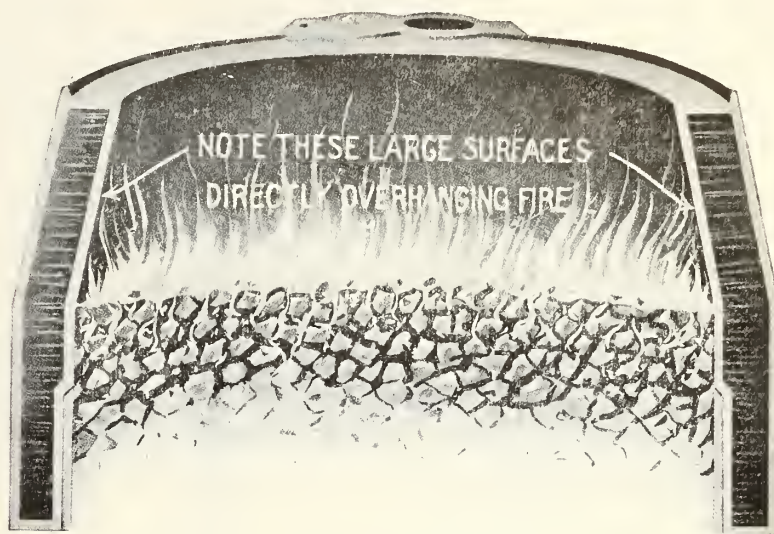
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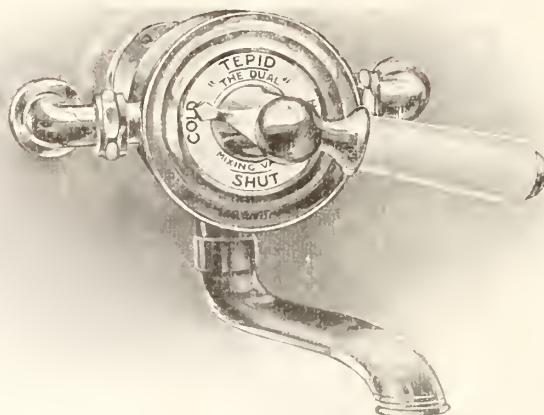
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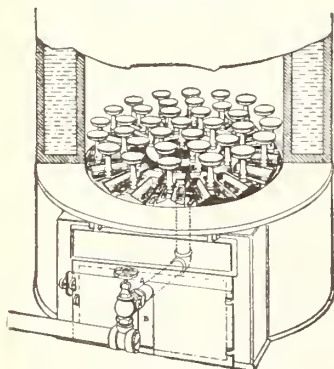
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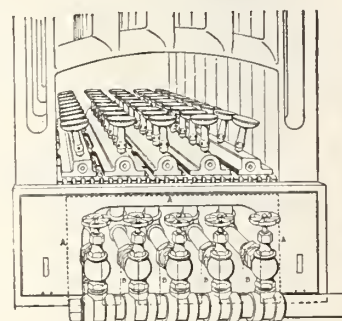
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SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, OCTOBER 1, 1914

No. 19

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The MacLean Publishing Co., Limited

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ESTABLISHED 1883

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A new tank will be given to replace one that at any time proves defective from either material or workmanship.



PLATE C 50



PLATE C 51

C 50 illustrates the Jarvis Washdown Closet with No. 5 White VITRO Tank, Hercules reinforced Birch Mahogany post, hinge seat and cover with cast brass floor flange and rubber gaskets, N.P. closet bolts.

C 51 illustrates the Montrose Washdown Reverse Trap Closet with No. 5 VITRO Tank, Hercules reinforced Birch Mahogany post, hinge seat and cover, with cast brass floor flange and rubber gasket, N.P. closet bolts.

C 52 illustrates the Bellwood C 52 Syphon Jet Closet, with No. 5 White VITRO tank, Hercules reinforced Birch Mahogany post, hinge seat and cover, with cast brass floor flange and rubber gasket, N.P. closet bolts.



PLATE C 52

Write for circular and name of nearest jobber who handles VITRO Tanks.

Cluff Manufacturing Company, Limited
65-75 Sterling Road
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There are more VITRO No Trouble CLOSET TANKS

being sold to-day than any other make on the market

BECAUSE

They are beautiful in design and handsome in finish. There are no joints to open up, no linings to leak, and when installed will outlast that of any other closet tank made. Fittings are made from the best quality ingot metal under highest grade workmanship. Each Vitro Tank is individually inspected and tested and adjusted under working water conditions before leaving the factory.

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MADE IN CANADA STEEL AND RADIATION, LIMITED

These **PLANTS** are devoted exclusively to the manufacture of the famous



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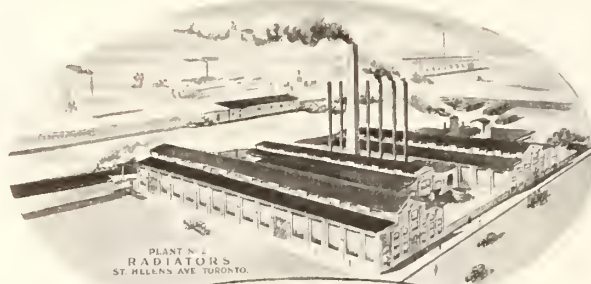
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"Imperial" Radiator

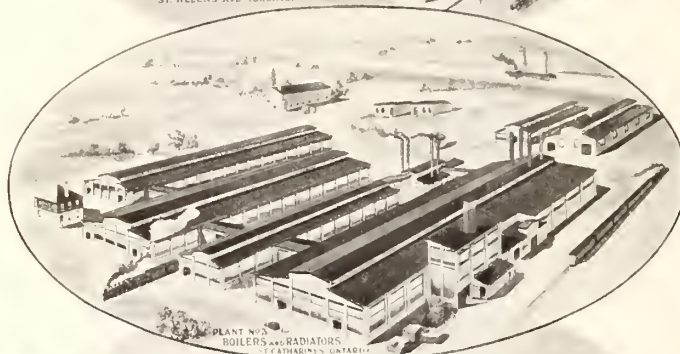


"KING" Radiator

Insist on having these **Canadian** made goods installed on your contracts.



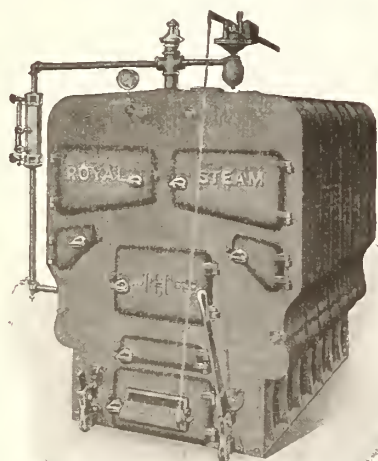
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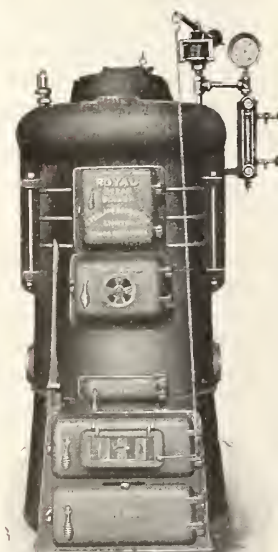


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THE SANITARY ENGINEER

VOL. VIII.

OCTOBER 1, 1914.

No. 19

Metallic Minerals of Dominion of Canada

The Value of the Metallic Mineral Production of Canada—Ore Resources in Some Cases Not Sufficiently Developed to Supply Home Demands—Location of Smelters in Canada.

Written for The Sanitary Engineer by W. J. Dick of Commission of Conservation, Ottawa.

THE value of the metallic mineral production of Canada, based upon the quantity sold or shipped, amounted in 1912 to about \$61,175,000. Although the production amounts to this large figure, practically the whole of the metallic minerals, consisting of copper, gold, nickel and silver, are exported elsewhere to be refined, the largest portion going to the United States. Canada imports annually a great variety of mineral products; the imports on iron and steel and manufactures thereof alone amounted, in 1912, to not less than \$124,375,000, while the imports of aluminum, antimony, copper, gold, silver, lead, platinum, tin and zinc and manufactures thereof and metallic alloys amounted to over \$27,000,000. As the value of the exports of the same minerals amounted to about \$25,000,000, it can be seen that there is a great excess of import over export. This fact would seem to indi-

cate opportunities for the development of the mineral production and of manufacturing industries using these minerals as raw products, and in this way do away with the anomaly of producing the raw product, exporting it, and then importing it in a partially manufactured or manufactured state.

In the case of the iron and steel industry, Canadian iron ore resources have not been developed sufficiently to supply home demands. In 1912 only 71,588 tons of Canadian ore was charged into blast furnaces, while 2,019,165 tons of imported ore was charged into blast furnaces.

Practically all of our manufacturing industries, depending upon metallic minerals for the raw products, use material which is either imported in a partially manufactured or a manufactured condition, and then finished or assembled in Canada.

Copper.

The copper ores are smelted at Trail, Grand Forks, Greenwood and Ladysmith, B.C., and excepting a small output of copper sulphate at Trail, is practically all exported for refining. The exports of copper in ore, matte, regulus, etc., from Canada during 1912 amounted to 78,488,564 pounds, of which 73,176,744 pounds were exported to the United States, and 5,275,820 pounds to Great Britain. The total imports for the same year exceeded 42,832,747 pounds, valued at over \$7,000,000.

Nickel Copper.

The nickel copper ores are derived largely from the Sudbury district; in fact, Canada supplies 85 per cent. of the world's production of nickel. These ores are treated at Copper Cliff and Victoria mines, but the resulting matte is shipped to the United States and Great Britain for refining.



View of Trail, B.C., where smelters are located.

In order to encourage the refining of nickel in Ontario, "The Metal Refining Act, 1907," Statutes of Ontario, 7 Edward VII., chap. XIV., authorized a bounty to be paid on nickel, cobalt, copper and arsenic under certain conditions and restrictions during a period of five years. In March, 1912, the Act was amended to cover a further period of five years.

The sections affecting nickel ore are as follows:—

The treasurer of the province may, under the authority of such regulations as may from time to time be made in that behalf by the Lieutenant-Governor in Council, pay in each year to the refiners of the metals or metal compounds hereinafter specified when refined in the province, from ores raised and mined in the province, a bounty upon each pound of such metal or compound so refined, as follows:—

"Class 1.—On refined metallic nickel or on refined oxide of nickel 6 cents per pound on the free metallic nickel or on the nickel contained in the nickel oxide, but nickel on which a bounty has already been paid in one form of the product shall not be entitled to any further bounty in any other form, and the amount to be paid as bounty on the nickel products herein mentioned is not to exceed in all \$60,000 in any one year."

Lead.

In the case of lead, Canada now refines practically the whole of the domestic production. The refineries are situated at Trail, B.C., and Kingston. The refined lead finds a market in Canada, United States and the Orient, Montreal being the main Canadian market. Of that used in Canada a great part is consumed in the manufacture of white lead.

In 1901, and again in 1903, the Dominion Government, to encourage the lead industry, authorized the payment of a bounty on the production of lead. The Act of 1903 provided that the bounty should cease on June 30, 1908, and as only a portion of the funds provided had been used, a new Act was passed extending the bounty for a further period of five years. The bounty is at the rate of 75 cents per 100 pounds, or approximately £3 10s. per ton of 2,240 pounds, subject to the restriction that when the price of lead in London exceeds £14 10s. the bounty shall be reduced by such excess.

Silver.

The silver production of Canada in 1912 amounted to nearly 32,000,000 ounces; of this amount over 95 per cent. was produced from the Cobalt district.

Important quantities of silver are produced in Canada, both as fine metal and silver bullion, ranging in fineness from 850 to 998.2. The fine silver is produced at Trail, B.C., and is shipped to

China, United States and Ottawa Mint.

The smelters in Canada treating Cobalt ores are situated in Ontario at Orillia, Thorold, Deloro, Kingston, North Bay and Welland.

The total exports of silver contained in ore, matte, etc., in 1912 was 34,911,922 ounces, valued at \$19,494,416.

Zinc.

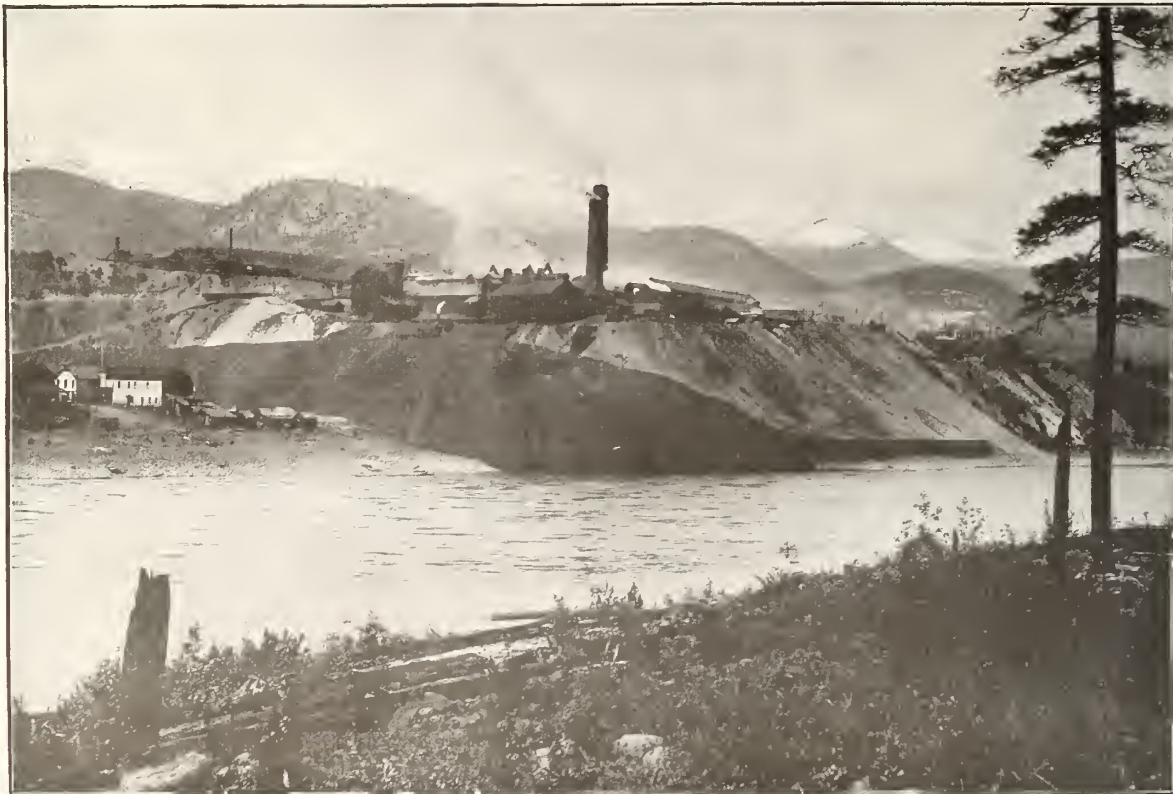
The zinc ores produced in Canada in 1912 amounted to nearly 6,500 tons, valued at about \$215,150, the greater part being from British Columbia.

This ore was shipped for treatment to Kansas and Oklahoma smelters, the duty being for this class of ore 1 cent per pound of metallic zinc content.

The imports in 1912 of zinc, spelter, and manufactures thereof exceeded \$963,000.

In order to encourage the smelting of the refractory zinc ores of British Columbia the Department of Mines are experimenting with these ores, and no doubt a satisfactory treatment will be found.

From the above it can be seen that the Dominion and Provincial Governments are encouraging in a substantial way the refining of metallic minerals in Canada, and it is hoped that the opportunities afforded will be the means of increasing the development, production, refining and manufacture of metallic minerals and mineral products in Canada.



Copper and lead smelter at Trail, B.C., where practically all the lead used in Canada comes from.

Sanitary Engineering in Country Homes

Getting After New Business From the Farmer—Farming is The Source of All Wealth— Why Not Enjoy City Conveniences?

SEVERAL years ago a certain member of the craft, who had had a little experience with gasoline engines was asked to drive into the country some 10 miles or so from the city. The farmer was having some trouble with an engine, and was in a bad fix. His corn was all cut and ready for chopping when the engine baulked. It was "some engine," at first sight one was reminded of Noah and the Ark. We are told that Noah was commanded to take two of everything into the ark, and from all accounts he did. Well this engine looked like one of Noah's stock. There were more things on that farm belonging to the same period. Well, after many plumbers' prayers had been offered DOWN, the engine went off and did all that could be desired, but the farmer decided it was better to keep the "plumber" on the job, for fear the engine took another turn, and ceased to turn.

While the plumber (who by the way is now a sanitary and heating engineer) was waiting the good pleasure of the engine to baulk, he took a stroll round the premises.

He found that this farmer kept about 150 head of cattle, 6 horses, did a big dairy business, etc. When the cattle had to be watered it took five or six men to do the work, to get through with it in anything like decent time. There was a well near the cow byre, but the cattle did not care to drink the water, even though it was clear, etc., and at the best it seemed, this well went dry for quite a few months each year. Seeing the engine still kept on with its good work, the plumber felt time hang on his hands, and began to help at the chopping, and later, took a ride on one of the wagons with the field from which the corn was being hauled. There he found a fine lake about $\frac{1}{4}$ of a mile long by $\frac{1}{8}$ of a mile wide. Remarking to the teamster that water seemed plentiful there, he was told that the water cart got drinking water for the hands from the lake. This lake was about 20 feet above the farm house and buildings and about $\frac{1}{8}$ of a mile away, thus it dawned upon the plumber that water could be easily conveyed through a pipe and by so doing, quite a number of improvements could be made. The cattle could have individual drinking troughs, the house could be fitted up with plumbing, hot and cold water, etc., and a pneumatic water

system could be installed which would answer for a fire apparatus. So, after weighing the situation up carefully, the plumber and the farmer began to talk of farm life, and the farmer said: "By gee, mister, but you city fellows have got us poor d——— skinned to a frazzle; just look at me. I'm up with the lark, till it's too dark to work," and he began to bemoan the life of the farmer, as against the easy snap that the city dwellers had, etc., etc. Then after the poor chap had got all his groans out, Mr. Plumber thought there'd be a little room for some cheerful stuff. "Mr. Farmer," says he, "you are living a hard life no doubt, but why? The cost of your help is more than it should be, your wife is nothing but a drudge. My wife wouldn't do half for me that your wife is doing for you. Would you like me to tell you how you can reduce your wage bill, the cost of the hired men's food and the wife's daily task, and in fact, enjoy every convenience and more than you could get in a city home? Would you like to just go into the house and turn on the hot water and have a bath?" "Bet your boots I would," replied the farmer, "but I'm no Cinderella, and you're no fairy god-mother. However, the conversation went on until the "wee sma oors o' the morn," and the farmer got his studying cap on.

For the next few days, plans were discussed and prices were got, and to-day that man has 250 head of cattle, a motor truck, a pipe line from the lake, automatic drinking appliances for the cattle, heating and plumbing and a pneumatic water system. His wage bill is less, and he has one less maid in the house than before. His wife is a wife, not a drudge, and he can have a bath whenever he likes hot or cold. He has as nice a lawn as could be desired, under which run the irrigation tiles from a septic tank, and he is happy. No city home for mine, says he, no noisy street cars, no smoky and dusty atmosphere.

Now, readers, what that plumber did, you can do. There is more work to be gotten in the country than one could realize, but you've got to go after it. You've got to take a bunch of catalogues with you and some convincing figures and get right down to business.

The writer had a farmer friend away out in a lonely district in Alberta some years ago, and this friend came to the

city to spend a few weeks. During the conversation it transpired that on account of the loneliness the farmer had bought an auto, to drive his wife out a bit. The writer said "You'd better have put some plumbing into your house, and the farmer thought it was a good joke. But the result was \$1,000 was invested in a whole outfit, and to-day there are many similar outfits in that same district. It requires tact and time to get these farmers to see eye to eye with you, and if the interest of the good housewife can be got, the time is nine times out of ten, well spent. The man to-day who will have the most money is the farmer, and there's no reason in the world why sanitary and heating engineers should not launch out after country business.

"LEST WE FORGET."

We need to be reminded quite as much as to be informed. Memory has been jocularly described as "the thing we forget with." Out of sight is apt to be out of mind.

An advertiser who relies on the memory of the public leans on a broken reed. The absence of its advertising from the newspapers has been the beginning of the end for many a firm. "The present suitor hath ever the advantage over the absent lover."

A business that has achieved its magnitude or strength as the result of faithful advertising plays itself false if it suspends or ceases its advertising, on the grounds of economy. It is poor business vision which fails to see the principal feeder of business, and fatal judgment which cuts it off or interrupts its flow. Economies may be warranted, but they had better be effected in any other department than in the sales department—the department of revenue. Any course which shoves your customer back from you or hides you from your customer is ruinous. The man with the money needs to be constantly sought. Advertising is the great discoverer of new customers, the great retainer of old ones.

If you forget the public, the public will forget you.

Analysis of Can. Sanitary Engineering By-laws

Continuing the Above Series We Are Again Taking Up the Plumbing By-Law in Force in Fort William, Ontario, Known as By-Law 1181 With Amendments.

THE next clause to comment upon is 26, and deals with the kind of pipe that is required for vent pipe, and also refers to the method of leaving branches off for future fittings or fixtures.

Clause 26.

All bent pipes shall be of galvanized wrought iron. Fittings to be galvanized or "steam quality." When branches are "roughed in" for tubs, vent pipes shall be brought to an accessible position, so that when fixtures are installed, vent can be connected. All branches left for future fixtures to be properly stopped with dead ends, or clean-out screws, with proper caulked and leaded joints.

While this clause is of a general nature, and is to some extent all that is required, there is, we think, one slight typographical error, otherwise the clause is not quite clear. The first part reads as follows:—"All vent pipes shall be of galvanized wrought iron, fittings to be galvanized or steam quality. The word **or**, we think, should be **of**, though at the same time we were not aware that galvanized pipe was used for steam. The wording, no doubt, means that all vent pipes and fittings shall be galvanized and of the same weight and quality as would be used if of back iron, which latter is used for steam installations.

We may, however, state that Fort William must have been one of the first cities in Canada to demand galvanized pipe for venting purposes, which goes to prove they were up to the times.

Clause 27.

That all material used shall be of the best quality of their several kinds, cast iron pipes to have the weight cast upon them.

This clause, while general, prevents pipe of questionable weight and quality from being used, and is a good clause.

Clause 28.

Clause 28 is one of few words, but of great importance, and reads as follows:

All work done under this by-law shall be executed by skilled tradesmen and in a workmanlike manner, and shall be subject to the inspection of the plumbing inspector.

It is to be hoped that none but skilled workmen are allowed to do such work; and if this be the case, Fort William is to be envied. This country is over-

run with men who pose as skilled workmen, and unless the craft as a whole can join hands in each city and demand that every man employed to install such work shall hold a certificate as well as a license from the Board of Health, showing that they have passed an examination and have proved that they are competent to install sanitary engineering, we feel sure that no great headway will be made.

Clause 29.

This clause refers to connecting old work to sewerage systems, and reads as follows:—

If application be made for sewer connection to any building in which the drains and plumbing are already installed, a permit to connect will be granted, if such work is found to be in accordance with the by-laws; if not, such alterations or additions to existing plumbing, also alterations or additions to existing fixtures, must be made to comply with bylaw as may be considered necessary by the inspector. If it is difficult or impossible to properly examine all fixtures and pipes in any building, on account of their being placed in positions not accessible, the owner or the agent shall make the pipes easily accessible if so directed by the inspector within five days after date of notice has been served to do so.

There are more good features in this clause than is seen at a glance. The main one is where it demands that all old work shall be brought up to standard and conform with the by-law. How many cases are there to-day in small towns and villages where there have been no plumbing inspectors, and where cheap-jack plumbers have installed a poor class of work. Then when sewers and drains have been laid, these poor installations have been allowed to drain into them. Sanitary Engineer believes in beginning as near right as possible, and at the same time not arbitrarily. When sewerage systems are laid out and operated, the first requisite is a practical man to act as an inspector of sanitary engineering, a man who is capable of formulating a set of by-laws. Then in case the plumbing does not conform to the by-law, act as Fort William is doing, and make all such work come up to the standard.

Further, while we are discussing this matter, we do not see why any owner of property should allow the present plumbing to continue a day if it does not conform with the by-law. It is only fair to those who are building now, and who must see that their plumbing does conform at the start, that all such work now in existence should also toe the line. It seems a foolish thing to demand proper sanitary construction of plumbing, and at the same time allow insanitary plumbing to exist.

Clause 30

The medical officer of health, plumbing inspector, or other official of the Board of Health, shall have the right and shall have access to enter upon or into any premises at all reasonable hours for the purpose of examining or inspecting any plumbing or drainage work, in order to force compliance with the provisions of this by-law.

This by-law is one of great moment if we realize what it would mean to the trade if a system of thorough inspection were to be put into operation. It would be a revelation to our different health departments to see some of the work at present doing duty in some of the buildings in our towns and cities.

Such a system to be carried out to-day would give all the work necessary to every member of the craft. Such a move would increase the usefulness of our sewage disposal plants, by preventing too great a volume of water flowing into them, which is the result of leaking ball cocks and taps. It would prevent the enormous waste of water, which is taking place, and cause property-owners to put their plumbing into good shape, thus making our homes more sanitary than is the case at present. We think there should be a number of inspectors doing nothing else year in and year out, and if such a move could be adopted, it would eliminate a large amount of work being done which should come under the heading of alterations and new constructions.

New By-Law To Be Enforced.

A new by-law in St. Catharines came into force recently to the effect that outside closets must be done away with on streets where there is a sewer. The by-law was passed in April last, and four months were allowed in order to give property owners an opportunity to make alterations.

Domestic Hot Water Supply Problems

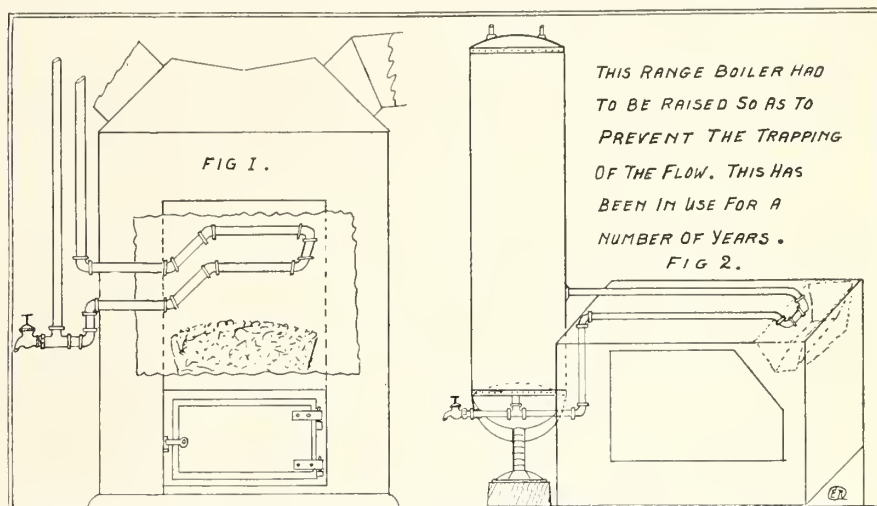
A Series of Articles Dealing With the Problem of Hot Water Supplies, Range Boiler Connections, in Several Forms and Methods Adopted as a Means of Heating Water Under Various Conditions.

ARTICLE 5.

IT has often been asked what size of a boiler should be connected to certain sizes and make of water fronts, and what would be a happy medium. But, on account of the varying conditions in which ranges are placed, as well as the relative location of boilers and ranges, such a question is almost unanswerable. The best rule to follow must be found by practical experience and common observation. It is not always the size of a water front which would decide the size of boiler to be connected to it, but rather whether a hot fire is going to be maintained continuously and the amount of water to be used. The writer has, however, found that a water front with an area next to the fire of about 90 square inches and connected to a 30-gal. boiler will give fairly good results for an ordinary household. That would mean a water front 5 x 18 inches. But a water front in a large range with a water front about 6 x 20 inches, viz., 120 square inches of surface, would require a 40-gal. boiler for the same size family. Both these cases will go to prove that it requires about 30 inches of heating surface to each 10 gallons of water. In the case of putting coils in firepot of a furnace, no matter whether it be a warm air, hot water or steam furnace, the same rule will be found fairly safe, allowing a few inches more for the distance the water has to travel. If the range boiler is situated in the kitchen and it requires 20 feet of pipe to reach from the outside of the furnace to the boiler, making in all 40 feet for flow and return, allow 1 foot of $\frac{3}{4}$ -in. pipe to each 10 gallons of water, and 1 inch for each 10 feet of pipe, therefore a boiler requiring 40 feet of pipe to reach the coil in the furnace would need to have a coil made of 3 ft. 4 in. of pipe. Of course this is allowing that the pipe is going to be near the coal though not actually touching it. At one period the writer tried a coil as shown in Fig. 1, and kept the pipe away from the fire. The frame of the door was drilled and the pipes run one over the other to the extreme back of the firepot, and in that case as much as 5½ ft. of $\frac{3}{4}$ -in. galvanized, copper or brass pipe was allowed. Of course it will be seen that at least 1½ feet was taken up in the entrance of the firing door: then the upper pipe was something like 10 inches from the coals. This latter method gave splendid satisfaction and could be made to fit and put in without either taking

the furnace down, piercing the furnace or even letting the fire down. Thus in case of a coil of this style burning out, it was a very easy matter to replace one without interfering with the furnace

style wood range to a range boiler, and it was not possible to get a water front for it. The location of the boiler, which was already installed, was such that the rear of the range would be just as



whatever, and it is well known that the time when these coils do give out is generally in the depth of winter.

Fig. 2 is rather an unusual installation. It was a case where a man of very limited means wished to connect an old-

shown. The job was put in with $\frac{3}{4}$ -in. galvanized pipes, which were bent so as to enter two $\frac{3}{4}$ x 1 inch elbows. The short horizontal piece which is in line with the firebox was 1 inch galvanized iron pipe.

Why I Should Be Loyal to My Own Community

Because my interests are here.

Because the community that is good enough for me to live in is good enough for me to buy in.

Because I believe in transacting business with my friends.

Because I want to see the goods I am buying.

Because I want to get what I buy when I pay for it.

Because my home merchant will take care of me when I run short of cash.

Because some part of every dollar I spend at home stays at home and helps work for the welfare of the town and the country.

Because the home merchant I buy from stands back of his goods, thus always giving value received.

Because the merchant I buy from pays his share of the county and town taxes.

Because the merchant I buy from helps support our poor and needy, our schools, our churches, our lodges and homes.

Because if ill luck, misfortune or bereavement comes the merchant I buy from is here with his kindly expression of greeting, his words of cheer, and, if needed, his pocketbook.

Let us make this town a good place in which to work and live. It's easy and certain if everyone will do his share.

The dollar sent away seldom returns, while the money spent at home is apt to leave a scrapling at your door.

The Sanitary Engineer

Plumber and Steamfitter of Canada

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TORONTO, OCTOBER 1, 1914

Made in Canada—What it Means to Us

IN our last issue we stated that sanitary and heating engineers need not spend one cent outside of Canada for their supplies. However, our friends across the line seem to think otherwise. In a recent issue, referring to plumbing supplies, one of our contemporaries said:

"Meantime the Dominion of Canada MUST also depend upon the United States for the greater bulk of its supplies, etc."

Such a statement is, to say the least, utterly absurd. As a matter of fact, we in Canada have a greater percentage of manufacturers, all in all, who are capable of turning out a larger output than our friends of the United States have. We do not love our neighbors less in these or any other times, but we should love our own manufacturers more in times such as these, and if our friends wish to join in our wealth and resources, let them do as quite a number have already done, viz., establish factories over here.

We know there are quite a few splendid specialties which we can and are willing to use, but, let us hope, not at the expense of our own manufacturers.

"Made in Canada" means a lot to us, and "made under the Union Jack" means a lot too. It means if the British nation had not bought so heavily from Germany, that she would not have been shedding the blood of her own soldiers and sailors as she is doing to-day. It is chiefly the British nation who have paid for the German navy, and her military equipment, and we should see to it that we buy no more goods from any nation that is likely to break treaties and go to war rather than advocate peace. The only solution is that we must first buy what we can from our own manufacturers and those who are under the British flag, and then from our friends to the South. "Made in Canada" is the slogan of the Canadian manufacturers and should be of every

householder as well. Last year Canadians bought \$618,000,000 worth of goods from foreign countries, half of which could have been made by our own manufacturers. This is equivalent to \$1,000,000 worth per day, for every working day of the year. Just think of it. We have a population of about 8,000,000 people, which means that we spent about 12½ cents per day each, per year, on foreign goods. At 300 working days a year, every man, woman and child is spending \$37.50 each per year. An average family of five actually decreases the national currency every year to the extent of \$187.50. Now, how much cheaper could our own manufacturers supply goods to us if this money were kept in the country? Goods don't make us rich. The man with a gold watch and no market for his watch isn't worth 10 cents, providing the gold watch is all his wealth. So if we bought all the goods in the world because we could buy them cheaper, and lacked the price of a loaf of bread, we'd be pretty poor. We are buying too much from the foreigner, and he is getting our money. Therefore, pardon us, you readers, if we again repeat at the foot of the page the words of Abraham Lincoln. Cut them out, paste them up over your desk, and look up at them when you open your order book.



Get After New Business

WE all know that the building trade is being held up for want of money to finance it. The pictures we see all over the Dominion, both in cities, towns and villages, are foundations and excavations left open; foundation walls run to the first floor, building about two-thirds erected, etc. Yea, at this very moment there are hundreds of thousands of men out of work, whose occupation is the building trade, and millions of dollars are tied up in partly furnished buildings. Thousands of dollars of de-

Practical Words of Wisdom

"I do not know much about political economy," said Abraham Lincoln, "but this I do know, that when we buy goods from a foreign country, we get the goods and the foreigner gets the money. But, when we buy goods in our own country we get the goods and we get the money."

preciation will take place, because of the severe weather conditions which will prevail within the next few months, and what is the reason? Simply that the banks have suddenly lost faith in real estate and will not further finance the building trade, not even to the extent of finishing work already begun. We know there are scores of sanitary and heating engineers who have money tied up in partly finished buildings and who cannot even get their equity out of these buildings. Never was there a more opportune time than the present, when sanitary and heating engineers should look to other fields for new business. The only people to-day who will get their money easiest are the farmers, and no class of people requires the services of the sanitary and heating engineer more than the farmer.

We would urge upon the employers to get busy and work up a campaign to get after the farmer. On another page we publish a story which is based upon an actual fact. And, we venture to state that if this opportunity is grasped by every employer we know what the result will be.

One of our readers when asked how business was, stated, "Well, you know, when the money began to be rather scarce a couple of years ago, I was about down and out, and I happened to get a job out in the country, since then I've nearly doubled my business and have only done three city jobs since, and a little jobbing of course. My trade is with the farmer. Since last spring I've installed ten pneumatic water systems."

Again we assert, "If the employer will get busy and cater to the farmer, he will get lots of business and lots of money which the farmer would otherwise be depositing with the bank."



Dont' Knock the Press

WE'VE all felt at one time or another that the daily or weekly newspaper did not give us a square deal. They seemed to make a joke of us fellows every time they got a chance, and strange to say we've resented the jokes. It's been the "plumber's this," and "the plumber's that," and instead of mending our ways "in many ways," we've simply knocked, and knocked. Now if there's one set of men who like to be knocked, it's the editors of a newspaper. If we could look behind the scene and see the smile of the city editor when some sore-head begins to knock, we'd never attempt to give him the satisfaction of smiling again at our expense.

We know we've got mountains of public prejudice to overcome, but we are like the army who, facing a mountain behind which the enemy is located, are satisfied to blaze away with artillery, waste our powder and shot, but never attempt to rush over that mountain and get at the real trouble.

The enemy don't know we've got the goods to beat down their army, neither do the public know we can give a square deal.

Our readers may ask what that's got to do with the newspaper. Here is the connection:

Take a little advertising in the newspaper, put up some strong claim for the goods you handle, make yourself known, and make good your claims every time.

At one time a lot of people used to think that advertising was mere bluff, but let us say right here that there is not a business man in existence that did not advertise, who can claim he has been as successful as he would have been had he advertised his goods.

Another point, when a person reads an advertisement in which certain claims are made, he will sooner or later take that advertiser at his word, if there is a sanitary or heating engineer in your town who advertises in the newspaper, you will find he is doing a successful business, providing he is not neglecting his business in other ways and provided he is making good his claims.

Therefore, "Don't knock your newspaper." Take up some of this advertising space in it. Make some claims, and back them up every time, and you'll find you'll get business as well as the support of the press every time. If there is a reader of The Sanitary Engineer who wishes some ideas as to how he can advertise in his town or city newspaper, drop a line to the editor. He'll help, and willingly.



The Tin Market

SINCE the outbreak of war a great deal of interest has centred round the tin market. The exceedingly high prices which prevailed immediately following the outbreak of hostilities caused much apprehension on the part of manufacturers who used the metal extensively in the manufacture of various products. There were some men in the trade who predicted continued high prices, while others maintained that Britain's means of keeping the trade routes open would have the effect of lowering the price after the first excitement of the war had subsided. It appears that the views of the latter were correct as proven by subsequent events. The excited war markets existing in August have given place to stagnant conditions, and heavy declines have taken place from the panic prices which were caused largely by a feeling that it would be impossible to secure supplies from abroad. There is at present no heavy demand for spot goods, and fears for future supplies have largely disappeared. It is quite evident that business and consumption has been seriously affected by the events of the past seven weeks.

\$1,000,000 Worth of Purchases Per Day

Last year Canadians bought \$618,000,000 worth of foreign goods, half of which could have been made in Canada. If these goods had been made in Canada every Canadian factory would have been rushed with orders. You strengthen your own credit and increase your own bank account when you buy goods *Made in Canada*.

Practical Course for Sheet Metal Workers

Article No. 2 of Series

By CHARLES SEIVERS

Rectilineal Figures.

Rectilineal figures are those which are contained by straight lines. The straight lines are called the sides and the sum of the sides is called the perimeter.

Rectilineal figures contained by three lines are called triangles.

Triangles.

Triangles are classified first according to their sides, and according to their angles. At A-B and C in Fig. 1, we show first at A, an equilateral triangle, that is one that has three equal sides; thus if B-C, C-D, and D-B are equal the triangle D-B-C is equilateral. At B we show an isosceles triangle, that is one that has two equal sides, thus if A-D and A-C are equal to each other the triangle A-D-C is isosceles. At C we show a scalene triangle that is one that has three unequal sides, thus if A-B, B-D and D-A are all unequal, the triangle A-B-D is scalene.

Classified Triangles.

At A-B and C in Fig. 2 are shown triangles classified by their angles. At A we show a right-angled triangle, that is one that has a right angle. Thus if D-B-C is a right angle, the triangle D-B-C is right-angled. At B we show an obtuse-angled triangle that is one that has an obtuse angle. Thus if A-D-C is an obtuse angle the triangle A-D-C is obtuse-angled. At C we show an acute-angled triangle, viz., one that has three acute angles. Thus if the angles at A, B and D are acute angles, the triangle A-B-D is acute-angled.

The Hypotenuses.

Any side of a triangle may be called the base. In an isosceles the side which is not equal to the other two is usually called the base. Thus at B in Fig. 1, D-C is the base of the triangle. In a right angled triangle one of the sides which contains the right angle is usually called the base, and the side opposite the right angle is called the hypotenuse, thus at A in Fig. 2, B-C is the base and D-C is the hypotenuse of the triangle D-B-C.

The Vertex.

Any of the points of a triangle may be called the vertex, if one side has been called the base, the point opposite is called the vertex. Thus at C in Fig. 2

if B-D is the base of the triangle A-B-D, A is the vertex.

Quadrilaterals.

Rectilineal figures contained by four sides are called quadrilaterals. In Fig. 3 are shown different classes of quadrilaterals. At A is a square. A square has four equal sides and its angles are all right angles. Thus if B-C, C-D, D-E and E-B are all equal and the angles at B-C-D and E right angles the quadrilateral B-C-D-E is a square.

A Rhombus.

A rhombus is a quadrilateral that has all its sides equal, but its angles are not right angles. Thus A-C, C-D, D-E and E-A are equal, the quadrilateral A-C-D-E is a rhombus.

A Parallelogram.

At C is shown a parallelogram. A parallelogram is a quadrilateral whose opposite sides are parallel. Thus if A-B is parallel to D-E and A-D is parallel to B-E the quadrilateral A-B-E-D is a parallelogram.

A Rectangle.

At D is shown a rectangle; a rectangle is a quadrilateral whose opposite sides are parallel, and whose angles are all right angles. Thus if A-B and E-C are parallel to each other, and A-E is parallel to B-C all the angles A, B, C and E are right angles, the quadrilateral A, B, C, E is a rectangle.

A Trapezium.

At E is shown a trapezium. A trapezium is a quadrilateral that has but two sides parallel. Thus if A-B and C-D are parallel the quadrilateral A-B-C-D is a trapezium. The line A-C in the rectangle shown at D is called the diagonal, a diagonal is a straight line joining any two opposite corners or angles.

A Polygon.

Rectilineal figures contained by more than four lines are called polygons. Polygons are named according to the number of sides.

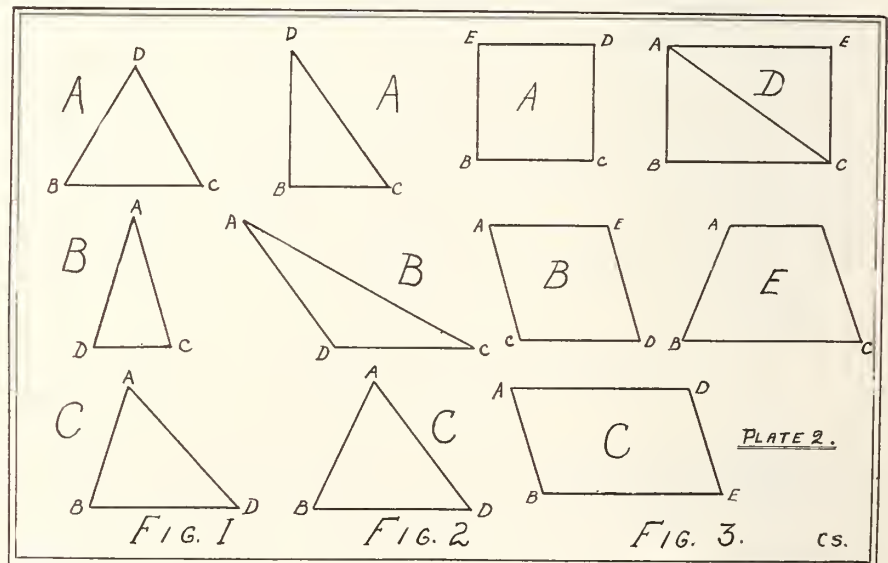
- A pentagon has five sides.
- A hexagon six sides.
- A heptagon seven sides.
- An octagon eight sides.
- A nonagon nine sides.
- A decagon ten sides.



TWELVE THINGS TO REMEMBER

By Marshall Field.

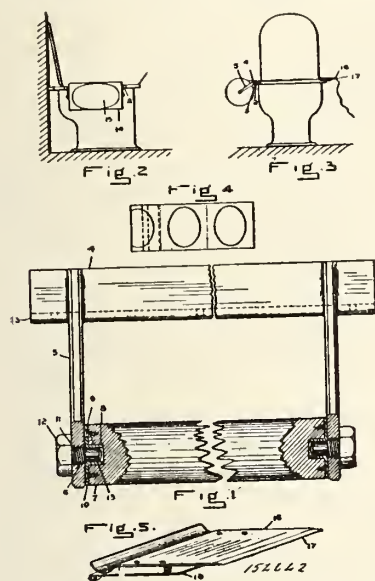
- The value of time.
- The success of perseverance.
- The pleasure of working.
- The dignity of simplicity.
- The worth of character.
- The power of kindness.
- The influence of example.
- The obligation of duty.
- The wisdom of economy.
- The virtue of patience.
- The improvement of talent.
- The joy of originating.



NEW CANADIAN PATENTS

Saul Abraham Jacobs, Montreal, Quebec, Canada, 24th March, 1914; 6 years. Filed 6th October, 1913. Receipt No. 229,707.

Claim.—The combination with a water closet seat, of a roll of paper having a succession of holes therethrough, each of said holes corresponding to the holes in the seat of the closet, a bracket rigidly secured to the under side of the seat of



Cover for Water Closet Seats.

the closet and having arms extending outwardly therefrom, bearings secured in said arms for said roll, and a clip secured to the seat of the closet at the opposite side from said roll receiving said paper, said clip having one of its members extending beyond the other and forming a tearing edge.

* * *

John Joseph Meyer, Yonkers, New York, U.S.A., 3rd February, 1914; 6 years. Filed 15th September, 1913. Receipt No. 228,948.

Claim.—1. In a siphon valve for flushing tanks and like fixtures, the combination of a siphon, and a manually controlled starting device for the siphon, comprising a cylinder opening at its lower end into the flushing tank and connected at its upper end with the said siphon, a plunger movable in the said cylinder, and a valve adapted to close on moving the plunger upward to prevent return flow of the water and to allow charging of the siphon and starting the same, said valve being provided with self-opening means for automatically opening the valve when the plunger is at rest.

2. In a siphon valve for flushing tanks and like fixtures, the combination of a siphon and a manually controlled starting device connected with the siphon for starting the same, the said starting device comprising a cylinder opening at its lower end into the flushing tank and connected at its upper end with the said siphon, a plunger movable in the said cylinder for lifting the water therein, and having an inlet opening, a valve controlling the said plunger inlet opening and moving with the plunger, the said valve being provided with floating means for normally holding the valve afloat in an open position, the said valve being adapted to close the said plunger opening on the upward movement of the plunger, and manually controlled means for raising the said plunger.

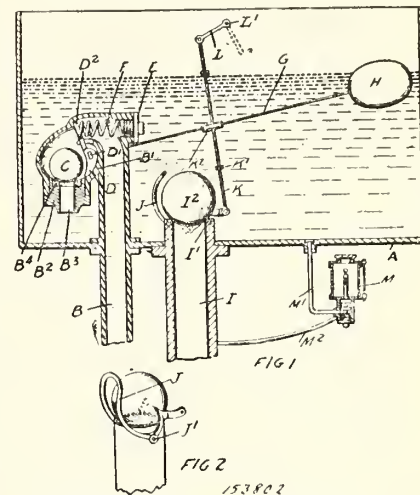
3. In a siphon valve for flushing tanks and like fixtures, the combination of a siphon and a manually controlled starting device connected with the siphon for starting the same, the said starting device comprising a cylinder opening at its lower end into the flushing tank and connected at its upper end with the said siphon, a plunger movable in the said cylinder for lifting the water therein, and having an inlet opening, a valve controlling the said plunger inlet opening moving with the plunger, the said valve being provided with floating means for normally holding the valve afloat in an open position, the said valve being adapted to close the said plunger opening on the upward movement of the plunger, a stem provided at its lower end with a collar for engagement with the under side of the said plunger, and a manually controlled means for raising and lowering the said stem, the bottom on being raised carrying the plunger along, and on being lowered allowing the plunger to descend independent of the stem.

4. A siphon valve for flushing tanks and the like comprising a siphon, a siphon starting device for starting the siphon provided with an air vent passage for breaking the siphon, and with a manually controlled adjusting device controlling the air vent passage.

5. A siphon valve for flushing tanks and the like, comprising a siphon, a siphon starting device for starting the said siphon and having a cylinder, a plunger movable therein, a stem for the said plunger, and having an air vent passage for connecting the atmosphere with the interior of the said cylinder, a manually controlled means on the said

stem controlling the said air vent passage, and manually controlled means for raising and lowering the said stem.

6. A siphon valve for flushing tanks and the like, comprising a siphon, a cylinder connected with the short leg of the said siphon, a plunger movable in the said cylinder, and having an inlet opening, a stem slidably engaged by the plunger and provided with a collar en-



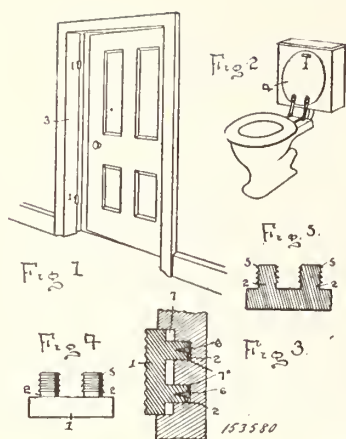
No. 153,802. Flushing Tank.

gaging the under side of the plunger to move the latter on raising the stem and to allow the plunger to descend independent of the stem on lowering the latter, a normally open valve held on the plunger and closing the said inlet opening on raising the plunger, the said valve opening automatically on the plunger coming to rest at any point in its upward travel, and manually controlled means for raising and lowering the said stem.

* * *

John H. Miller, assignor, Alexander K. Phillips, assignee of a half interest, and Harry Fisher, assignee of a sixteenth interest, all of Washington, District of Columbia, U.S.A., 10th February, 1914; 6 years. Filed 4th June, 1913. Receipt No. 225,152.

Claim.—1. As an article of manufacture, a bumper formed of elastic material having a rectangular body portion, an integral anchoring stems, the face of said body portion being corrugated, said stems having a plurality of annular lips disposed in a plane oblique to the stems and flared toward the body portion, said stems and lips being adapted to be depressed for insertion within suitable seats for preventing the free withdrawal thereof.

**153,580. Bumper for Seats.**

2. As an article of manufacture, a resilient bumper with a body portion and anchoring stems projecting from the rear of the body, the said stems having annular lips to hold the bumper in position.

* * *

Stuart E. Davis, Alfred G. Smith and Shirley P. Sanderson, co-inventors, all of Baltimore, Maryland, U.S.A., 10th February, 1914; 6 years. Filed 22nd August, 1913. Receipt No. 228,222.

Claim.—1. The combination of a sink having an opening in the bottom thereof and provided with an annular ring, or lug on its lower surface just back of said opening, a neck provided with an annular flange near its upper end, said upper end of the neck projecting into the annular ring on the sink, and the flange impinging against the lower surface of the said ring, that portion of the neck which projects into the annular lug, or ring, has its outer surface impinging against the inner surface of said annular ring or lug to form a tight joint, and means to hold the neck to the sink.

2. The combination of a sink having an opening in the bottom thereof and provided with an annular ring or lug on

its lower surface just back of said opening, a neck provided with an annular flange near its upper end upon which the annular ring on the sink rests, the upper end of said neck projecting into said ring and impinging against the lower surface of said sink, that portion of the neck which projects into the annular lug or ring has its outer surface impinging against the inner surface of said annular lug, or ring, to form a tight joint, means at the lower end of said neck to secure the waste pipe to the neck, and means for securing the neck to the sink.

3. The combination of a sink having an opening in the bottom thereof provided with an inwardly tapering edge, said sink being provided with an integral annular ring just back of said opening, a strainer covering said opening and resting on said tapered edge, a neck provided with an annular flange near its upper edge on which the annular ring on the sink rests, the upper end of the said neck projecting into said ring and impinging against the lower surface of said sink, that portion of the neck which projects into the annular ring has its outer surface impinging against the inner surface of the said annular ring to form a tight joint, means for securing the neck to the sink, and means at the lower end of said sink to secure the waste pipe to the neck.

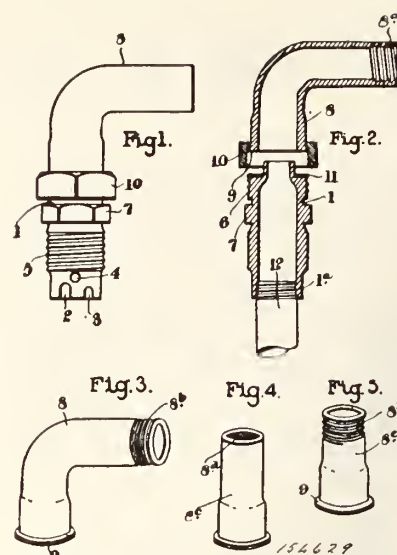
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John Edward Gibson, Hamilton, Ontario, Canada, 24th March, 1914; 16 years. Filed March 18th, 1914. Receipt No. 221,959.

Claim.—1. A union for hot water boilers comprising a lower portion having an externally threaded central portion for screwing into the boiler and an externally threaded upper end, the lower end of the lower portion being provided with vertical slots, and upper portion independent of the lower portion and having a flared lower end, and a nut extending over the flared lower end and adapted to be screwed down onto the externally threaded upper end of the lower portion, as and for the purpose specified.

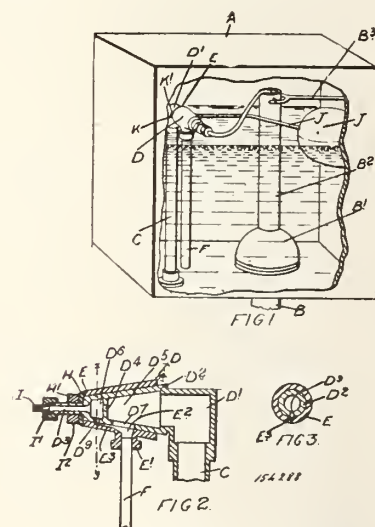
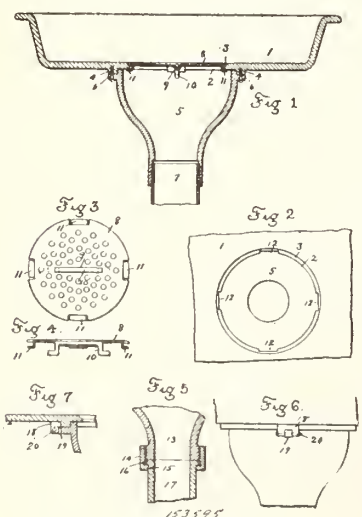
2. A union for hot water boilers comprising a lower portion having an externally threaded central portion and an externally threaded upper portion, the lower end of the lower portion being internally threaded and being provided with a vent extending therethrough and vertical slots and upper portion having a flared lower end, and a nut extending over the flared lower end and adapted to be screwed down onto the externally threaded upper end of the lower portion, as and for the purpose specified.

3. In a union for hot water boilers a lower portion having vertical slots in the lower end thereof, as and for the purpose specified.

**Union for Hot Water Boilers.**

Edwin Fisher and Ross O'Brien, co-inventors, both of Toronto, Ontario, Canada, 10th March, 1914; 6 years. Filed 28th May, 1913. Receipt No. 224,943.

Claim.—1. In a flushing device, the combination with the main water supply pipe, and refill tube leading into the flushing pipe, of a tapered hollow valve plug connected at one end to the main supply pipe and at the opposite end to the refill tube, a central partition extending across the hollow valve plug, ports located in the wall of the valve plug to each side of the partition, and a tapered valve seat having a tank supply orifice located normally opposite one of the ports of a valve plug, and a groove extending from such orifice to a point opposite the port on the other side of the partition, and means for turning the seat on the plug operated by the rise and fall of the water in the tank so as to carry the tank supply orifice and groove in and out of alignment with the ports in the valve plug, as and for the purpose specified.

**No. 154,288. Ball Cock.****No. 153,595. Sink.**

Simplified Sanitary Engineering Construction

A Discussion on Simplified Methods of Piping and General Construction in Sanitary Engineering. With Quotations From Expert Authorities. A Topic of Unusual Interest.

NEVER in the history of the trade was the time more opportune than now, for the discussion of simpler methods of sanitary engineering construction. There are more towns and cities at the present day considering the advisability of adopting new by-laws governing such work, or revising their present by-laws.

Authorities on such work are being consulted, and are advising that simpler methods be adopted than those which are at present being practised. The writer was lately taken to task severely by several of the craft, for advocating that the venting of traps in many cases was an abortion, etc., and one member justified the method of indiscriminate trap venting as a safeguard against the syphoning of trap, "because there are such a lot of men in the profession who do not know when and where not to vent a trap."

To be very conservative we would state, that not less than one-third of the cost of piping is accounted for, in this wholesale practise of back-venting and re-venting, etc., and it seems unreasonable to expect the public (whose servants we are) should be called upon to bear such a useless expense, because there "are such a lot of incompetents in the profession."

First of all we would suggest that not only should there be by-laws to govern the construction of sanitary engineering, but also to govern the sanitary engineers, who are practising in the profession, and in that way we should cease to encourage the practice of allowing any person, irrespective of his competency to enter the profession. The reason why sanitary engineers are not better off financially is because there are so many men in the trade who are neither practical nor good business men.

Men as a whole who are practical whatever be their calling, are much more desirable competitors than the man who is not practical, and the adoption of complicated methods only tends to make matters worse. Therefore, we would urge that every city inaugurate some form of examination, which men who seek to engage in this calling should be called upon to pass. Then adopt ordinances to govern the construction of such work.

We have discussed this very topic in *The Sanitary Engineer* several times, and recently our attention was drawn to the fact that quite a number of our read-

ers have referred these articles to several experts on sanitary engineering, therefore we intend quoting some of the best authorities in this article as well as in others which will appear from time to time.

As far back as the year 1899 Dr. Wm. Paul Gerhard, consulting sanitary expert and hydraulic engineer, New York, stated in one of his books that:—

Modern plumbing work, as carried out by the majority of plumbers and as required, with only very few exceptions, by the rules and regulations of health or building departments, is open to one serious objection, viz.: It is unduly complicated, unnecessarily elaborate and too costly. I have, for many years, made strenuous efforts in favor of a simpler but equally safe system. Other prominent authorities in sanitary engineering have, from time to time, entered protest against the prevailing methods of doing work. Among architects, builders and a few progressive plumbers the good seed scattered has taken root, and it is to be hoped that before many years a reaction in favor of simpler methods and rules may set in.

About fifteen years ago the so-called "trap venting law" was first inaugurated in New York City, Boston and a few other places. This law requires that "all traps must have a vent pipe of suitable size connected at or near the crown of the trap, and extended either separately up to the roof or connected with the soil or waste pipe line above the highest fixture." Within recent years a great many of the smaller cities and towns have followed the example of the larger cities and have instituted plumbing rules and plumbing inspections. Unfortunately, in the majority of cases the mistake was made of copying either entirely or partly, the rules as adopted in the larger cities. This was a mistake, at least as far as the trap venting rule was concerned.

I am, as much as anybody, in favor of good, sound, and safe plumbing work. Moreover, I have no personal interest in any patented plumbing device or in any trap, and therefore have no axe to grind. My work consists largely in laying out, specifying, arranging and superintending the plumbing and drainage work of public and private buildings, and my professional reputation (not to mention my business prospects) would be at stake if I were to advocate systems or methods which would not be at least as safe as

the methods recommended or insisted upon by boards of health.

A few years ago I defined my position in the matter of trap ventilation in an article in the *American Architect*, which I quote nearly in full herewith:

"Trap Ventilation."

It is, in my judgment, only a question of time when all plumbing regulations will be so changed as to leave it optional with the owner or architect of a building whether to "back air" his traps or to adopt the much simpler and safer system of non-siphoning traps.

I have, as early as 1884, gone on record as being opposed to any useless and expensive system of trap ventilation, and have since then repeatedly asserted my belief in, and preference for, non-siphoning traps and a simpler plumbing system. In my book "*Hints on the Drainage and Sewerage of Dwellings*," published in 1884, and now out of print, I expressed my views regarding trap ventilation as follows:

While admitting that such air pipes render S-traps practically safe against most of the above-made objections, it cannot be denied, on the other hand, that they largely increase the cost of plumbing in dwellings, especially so, where fixtures are much scattered throughout the house.

First, they complicate the work and are difficult to run in old buildings, and must be largely increased in the case of high buildings, towards the upper floors.

Second, they increase the evaporation of water in traps, and therefore aggravate the danger from sewer air entering through fixtures in cases where these remain unused for a long time.

Third, it is quite possible that vent pipes stop up in time at the crown of the trap with splashings from soap suds, when they will cease to furnish aid to break the vacuum. Unluckily, such fact would not reveal itself, and is not easily detected, nor is much known at the present time about this point.

The literature on this subject has been lately enriched by numerous careful and valuable experiments upon the siphonage of traps, made by Col. George E. Waring, Jr., assisted by the writer; by Messrs. Edward S. Philbrick, C.E., and Ernest W. Bowditch, C.E., of Boston; by Mr. S. S. Hellyer, of London, England; Dr. Lissauer, of Dantzie, Germany, Dr. Renk, of Munich, Germany, and others.

“Shop Economics”—A Talk With Boss, Journeyman and Helper

Showing Where Savings Could be Made, Where the Boss Would Save, Journeyman Earn, and Helper Learn, by Adopting the Right Method at the Right Time.

It is not many years ago when, if it became known to the boys 'round town, that one of the bosses had planned a hot water job where every radiator gave lots of heat, where none were short circuited, and he had got his money without a kick, every journeyman in that town would want to be working for that boss. The same if a steam job was put up, where there was no hammering.

That boss would be considered a marvel. Now let us look at some of the jobs. There would be all kinds of peculiar connections, etc. The writer once came across one hot water job where a piece of flat iron had been jammed into a riser to prevent the radiator above from robbing one on floor below. Another job had two reducing couplings and a smaller sized nipple between them to answer the same purpose. Care was always taken that this connection was made between the floor so that no other “guy would get onto the kink.” Another chap said he didn't have to bother putting the kink between the floor. All he did was to heat up the end of his piece of pipe and close up the end a bit then thread it, and no one would be the wiser. Yes, it's humorous to think of the jokes we fellows have pulled over “ourselves.” Just look at some of those hot water jobs which had a separate return for each radiator to the furnace, the same with that silent 2-pipe steam job, where you could scarcely see the side of the boiler for returns. If in those days a fellow spoke of reaming the burr out of a pipe to overcome a certain amount of friction, that man would be branded by the boss as “a time-wasting faddist.” If that same man had dared to use a nipple and a 45 deg. elbow when taking off a branch or had failed to place a bull-head tee when carrying two lines of pipe in opposite directions, that man would have been “fired.” But, what do we see to-day? Very seldom a bull-head tee, very seldom any other method of taking a branch off a main but by using a nipple and 45 deg. elbow, very seldom do we see all that pipe wasted for separate returns.

At one time we looked upon the man who adopted scientific methods as one who was full of mystery. To-day, we know that if science has done anything it has simplified matters. It has applied the mysterious to the natural. Therefore the boy or man who studies the science and theory of his calling,

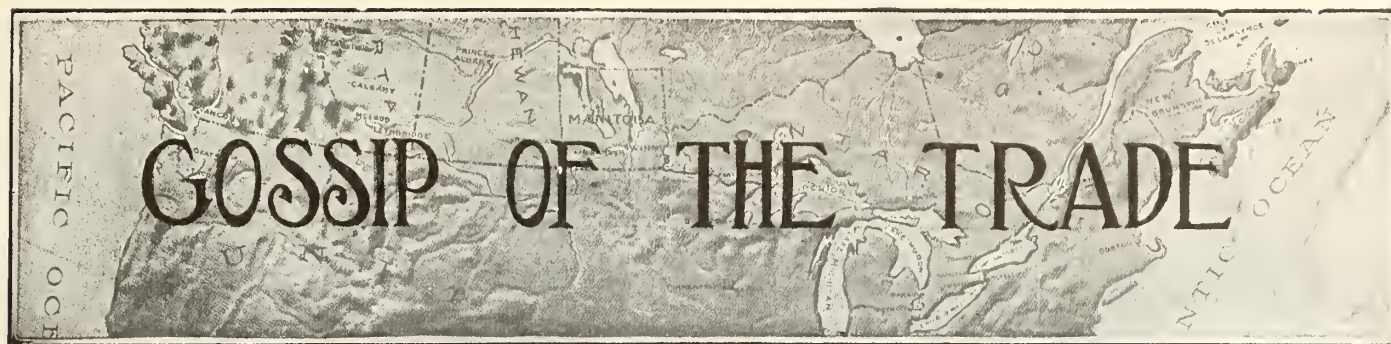
then applies what he has learned to his daily work, is “the” boy or man who is making good. The kinks we have spoken about, and which are silly to say the least, could easily have been overcome, had a little study been devoted to the science of one's calling. To illustrate our point and at the same time to prove that applied science is not necessarily a complication of technical phraseology, we will mention two instances.

The writer called upon a sheet metal worker some time ago, and asked if he allowed his boys to develop patterns. He was told that, it required a very scientific education to do such work, that the boys who came to be tinsmiths had little or no education. No doubt the latter statement was correct, but the former certainly was wide of the mark, as can easily be proved by reading one's trade paper. The sheet metal articles are free from complication. Articles dealing with other every-day problems are as simple as can be and free from technical phraseology. To-day there are correspondence schools, which specialize their courses, with a view to helping the wage earner to become master of his occupa-

tion. They make men who for years past have been mere machines, and in these days the man who does everything because the other fellow does the same is no more than a mechanical laborer.

In the other instance a plumber's helper had read an article that appeared in a recent issue of the Sanitary Engineer and which dealt with the subject of making light wiped joints. This boy was being instructed by the man he was assisting, that “There was no fear of a good heavy joint leaking,” and when the lad read of the pressure placed at the cap on the w.c. lead bend and the poor way those caps are soldered, he saw at a glance why a lighter joint was infinitely better than a heavy one. In conclusion let us again remember the struggles and trials which have been overcome by the craft, and see to it that our assistants, as well as our journeymen are prevailed upon to devote more study, and take up some special course in their particular line and by so doing become more efficient, and more worthy of their calling. Then we shall as a great writer once said, Have learned to, “talk less though say more,” or work less and accomplish more.





City of Regina is Urged to Put Plumbing in Houses.

At a recent meeting of the city council in committee of the whole, Alderman Lorimer suggested that the city commissioners should work out some scheme for installing plumbing fixtures in the houses of people who cannot afford to do this work, on the local improvement basis, that is to say, by assessing the cost of the materials and work against the property, and collecting in the form of taxes over a period of years.

In advancing this proposal, Alderman Lorimer declared that there were a large number of people who had sewer and water past their houses, but who were unable to lay out several hundred dollars to connect up. He thought, if for no other reason, it was in the interests of the community that these installations should be made from a health point of view.

Some of the aldermen urged the objection that a large number of houses were not in a fit condition for the installation of plumbing fixtures. After some desultory discussion the matter was allowed to drop despite a good deal of insistence on the part of the member for ward five.

Commenting upon this newspaper clipping, particularly the last paragraph, which leads one to believe that the recommendation was dropped, we would remark that it is a disgrace to such a splendid city as Regina, or any other Canadian city, to have such back numbers on their council, that they should object to such an admirable move as was championed by Alderman Lorimer.

If the houses are in such a state as not to be fit to instal sanitary fixtures, then they are far more unfit for human habitation. If, on the other hand, the owners are too poor to make them habitable there are only two courses to follow, either condemn them and pull them down or let the city make them habitable in every respect. The city are, we presume, drawing taxes. If any of the children of those aldermen who blocked the scheme, were to come in contact with children living in those houses, and the aldermen's children took sick as a result, they would sit up and take notice.

Somehow we feel that it is the duty of our boards of health to order such work, and boards of health have a power vested in them which can and should override any puny opposition on the part of alderman.

When a town or city becomes sick, as Ottawa did recently, the M.O.H., is discharged, the city engineer is disgraced, and scores of lives are lost, "because" of the fact that the aldermen have been too small for the position they are elected to fill. We thoroughly endorse Alderman Lorimer's scheme and go further in saying that if the houses in question are "not in a fit condition for the installation of plumbing fixtures," they are certainly not fit for human habitation and are a menace to the whole city of Regina.



Change of Business at Ingersoll, Ont.

Mr. James Sinclair has disposed of his tinsmithing and plumbing business to Messrs. D. Howe and James Henderson. The new firm will be known as Howe & Henderson. Mr. Howe has for a long period been associated with S. King & Co., while Mr. Henderson who learned his trade with that firm, only recently returned from Saskatoon, where he has been in business for several years.



M.O.H. Gone to the Front.

Last issue we published the fact that Dr. Ruttan of Woodstock, Ont., was going to the front, and now we find that Ottawa is to lose Dr. Lomer, their M. O. H.

Toronto is to lose Dr. Nasmith, as will be seen by the following:—

Dr. T. A. Lomer, medical officer of health for Ottawa, will sail for the front with the first Canadian contingent and will not be able to return to Ottawa before he leaves. It is understood he is applying for leave of absence.

Dr. G. G. Nasmith, director of the city laboratories, will go to the war with the first Canadian contingent. Permission for him to do so was accorded this morning by the Board of Control on the receipt of the following telegram from the Minister of Militia:

"The Canadian overseas contingent will be very highly honored and benefited if the city of Toronto will be good enough to spare the services of Dr. George Nasmith for Empire purposes of being in charge of the purification of water and advisory in the sanitary matters with the overseas expeditionary force to Europe. Dr. Nasmith is willing to go provided the city will permit him. Personally, I should be greatly gratified if you will thus oblige Canada and the Empire.

"Sam Hughes."

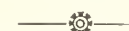
All these three gentlemen have been, and are earnest workers for the progress of sanitation. Dr. Ruttan was instrumental in getting a by-law established to govern sanitary engineering construction in Woodstock.

Dr. Lomer has creditably filled the position of M. O. H. at Ottawa, and is a hard co-worker with sanitary engineers. Dr. Nasmith has been particularly valuable as Toronto's city laboratory director.



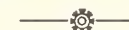
Vapor Heating Bulletin.

The C. A. Dunham Co., Ltd., Toronto, have issued a very interesting bulletin on the subject of "The Dunham Vapor System." It is known as Bulletin No. 11, and deals very clearly with their method of vapor heating. It is illustrated which adds to its value to the trade. Every heating engineer should secure one of these bulletins, which are free and may be procured by writing to the C. A. Dunham Co., Ltd., corner of Davenport and Primrose avenue, Toronto.



Instructors Appointed.

Joseph Duhamel, Georges Brisson, and A. Paquin have been appointed instructors in sanitary engineering by the Council of Arts, Montreal, the classes to be held in the upper part of St. Lawrence Market.



New Established Business.

Antonio Normand has opened a plumbing shop at Mount Laurier, Que.



MacLean Publishing Co. in New Quarters

AT the end of August the offices of the MacLean Publishing Co. were moved into the new building, which has been in course of construction for the past year. The above illustration shows the present plant of the MacLean Publishing Co., the new building to the front and left, the old building to the rear and right of picture.

The old building was built a little over four years ago, being used for business offices and the mechanical departments as well. Capacious enough to house the organization comfortably at the time of its occupation, this building ordinarily would have served as the home of the MacLean Publishing Co. for many years. The aggressive policy of the company, however, led to unprecedented expansion, each of the fourteen papers composing the "MacLean group," showing a rapid growth. The staff necessarily grew until the building was found quite inadequate and accommodation had to be found outside for some departments. The erection of a new building on the north-west corner of the lot was then started.

Under present arrangements the new building is occupied by the editorial and business offices. The ground floor is occupied by the business, accounting, circulation and subscription departments, together with the offices of some of the executive officers, including the president, Col. MacLean. The floors above are occupied by the staffs of the various papers, including the business managers, editors, advertising men, advertising copy writers and artists. The old building will from now on be given over entirely to the mechanical and stock departments.

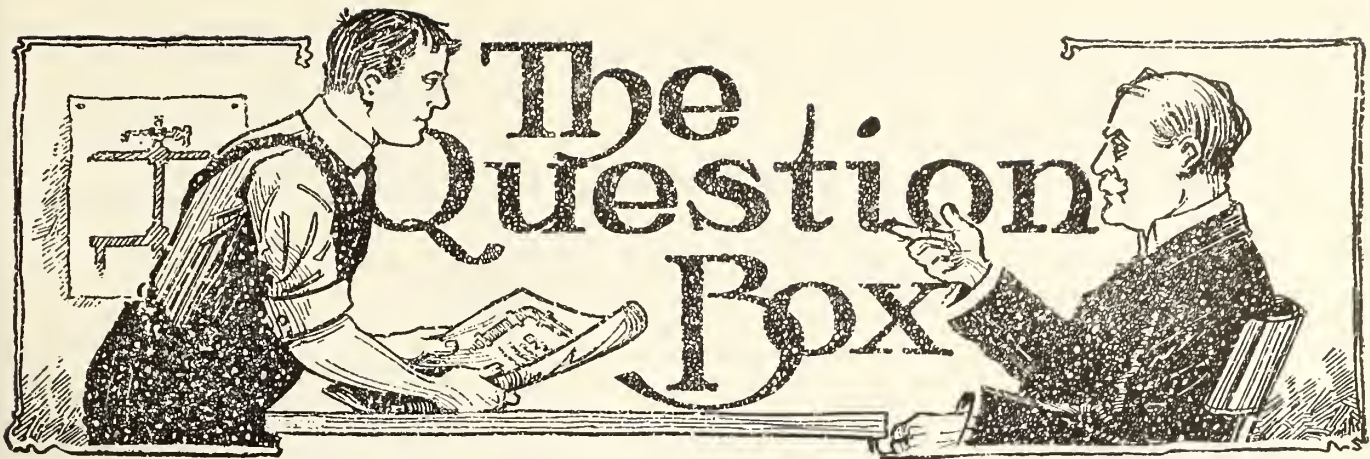
The new building is the result of very careful planning. It is airy, well-ventilated and, above all else, light. There are thirteen large windows on each floor, so that the space within is flooded with light and the facilities for ventilation are equally unexcelled.

For the convenience of visitors the location of the various papers may be given as follows:

First floor (above ground floor).—On right: Canadian Machinery, Power House, Canadian Foundryman, Marine Engineering, Dry Goods Review, Men's Wear Review. On left: Hardware and Metal, The Sanitary Engineer, Bookseller and Stationer, Printer and Publisher and Canadian Grocer.

Second floor.—MacLean's Magazine, The Farmer's Magazine, The Financial Post, Ad. Service and Art Department.

Friends of the MacLean papers are cordially invited to visit the new headquarters of the company.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

Will This Plan Work?

Editor Sanitary Engineer. — Please tell me in your next issue if the plan here submitted for a small heating job would work. I want to heat two rooms from the range boiler, and if possible not put any piping up on the ceiling.

A. B., Lachine.

Replying to our correspondent, A. B., we regret to state that the plan of piping as submitted would not give any results. In the first place, when any radiation is being taken off a range boiler, which has been provided for either by having an excess quantity of hot water, or by placing extra heating surface in a heater or range, the top connection should never be placed at the top of the range boiler. When such a connection is made, it is for the purpose of getting

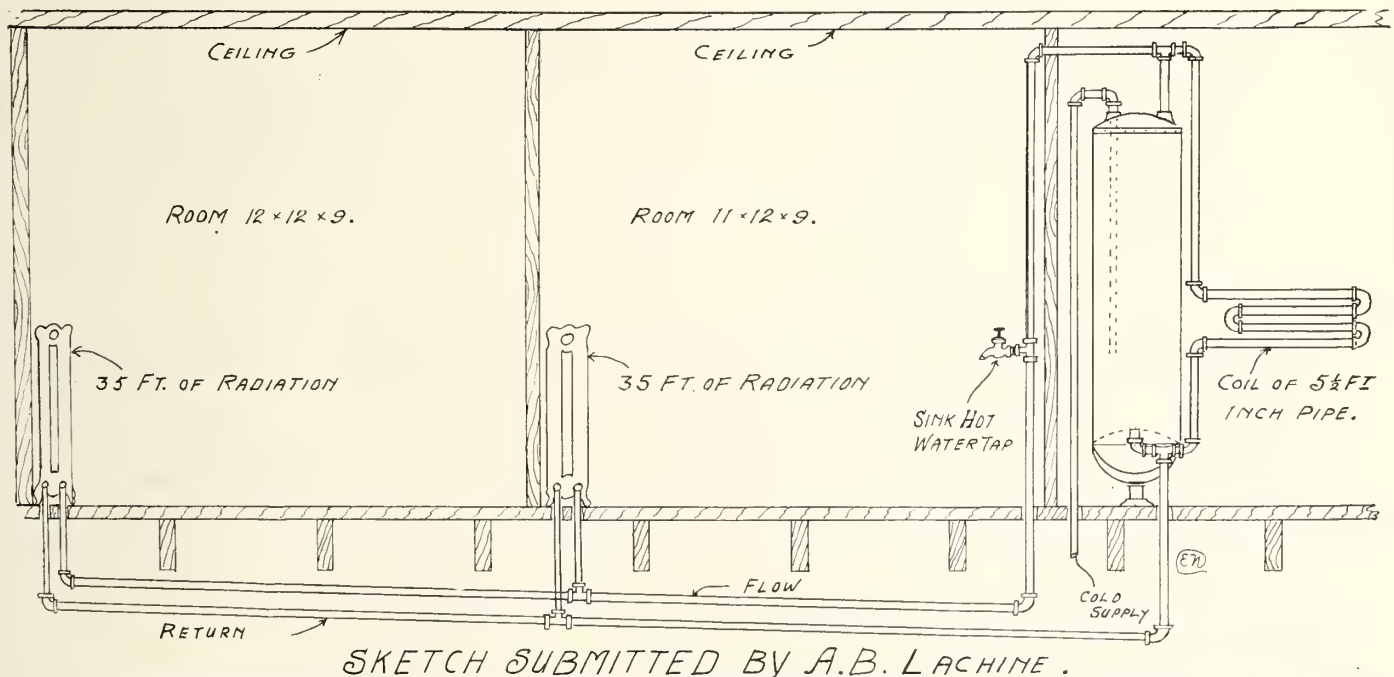
a small quantity of hot water quickly, but volume of hot water would be slower than if the connection be placed at the side, which is the proper place.

It is impossible to get any satisfactory result, if the two pipes are carried down as shown under the floor. There must be an elevated pipe somewhere to form a circuit, or loop. If our readers will follow the pipe line of sketch submitted by A. B., starting at the elbow on the top pipe of the coil, and follow the lines of least resistance, it will be seen that the hot water will travel up to the tee and down into the boiler, and on down to the lower pipe at the bottom of the boiler, then along through the tee and elbow up through the coil and keep on circulating in that manner, the boiler would be the line of least resistance, and form a short circuit, therefore cutting

out the circulation from the radiators altogether.

Another feature to be avoided when using a range and boiler as shown, is that of twin connection radiators, these should be avoided by all means, because while they are alright for an ordinary heating installation where mains are provided and the whole system is suitably laid out, they are not suitable for a system such as we are considering.

We have shown in another sketch the best way to heat these two rooms from a coil. Of course in this particular case must be taken to have a good fire on constantly, because, if the temperature of the water lowers, then the circulation will become sluggish and little or no heat will be gotten. Five and a half feet of one-inch pipe should be sufficient, but that all depends upon two things, a con-



stant and clean fire, and a conserving of the hot water in the range boiler, which might with advantage be covered with an inch of asbestos boiler covering, or several layers of corrugated asbestos paper.—Editor.



New Heater.

Messrs. Vici Radiator Co., Hamilton, are handling a very novel automatic gas heater for which they make some very



remarkable claims. It is not only automatic, but is also instantaneous. It is known as the New 3-63 inch. Parrott Heater. The company also claim to be able to put this heater on the market at a much less cost than most heaters of its kind. Any member of the trade who

wishes to know more about it will do well to write the above firm for full particulars.



Useful Gas Heater.

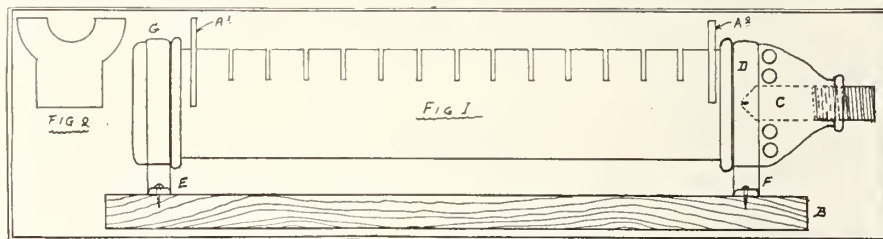
A handy and easily made gas heater is shown in Fig. 1. Take a piece of $\frac{3}{4}$ inch pipe, nine inches long threaded on each end. Cap it at one end. Take a $\frac{3}{4}$ x $\frac{1}{4}$ reducing coupling D, drill several holes in it as shown and screw it on the other end of the pipe. Take a piece of $\frac{1}{4}$ pipe threaded on one end and forge the other end nearly closed leaving a hole about 1-16 of an inch as at C. Screw it into the coupling before putting the coupling onto the pipe. With a hack saw cut cross cuts along the pipe as shown, make two pieces of iron, cut from galvanized sheet will do, like A, place them in the end cuts at A¹ and A², they are supports for soldering iron or any other piece of iron needing heating. Place two pieces of iron, ($\frac{1}{2}$ inch bushings will answer) at F and E and strap all to a wood base B with straps G and

H. I have made and used this heater although the description is long it is only a small job to make one, and it is a thousand per cent. better than the ordinary gas ring in use in many small plant jobbing rooms.

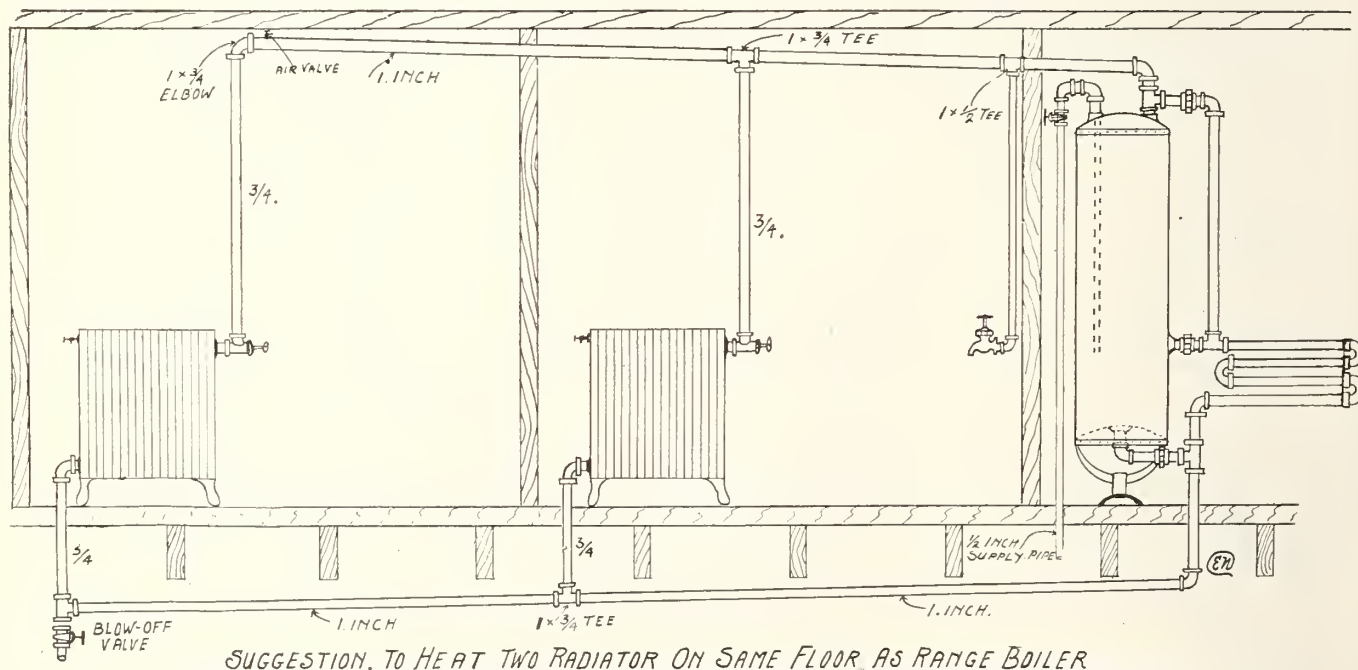
John Thorn, Toronto.

NOTICE TO READERS.

We have quite a number of readers who send in questions to be answered but fail to give us their address. We would like to receive addresses as a guarantee of good faith, also to enable us to answer their question privately. For instance, we had several questions which showed the answer was urgent, because of its very nature, and in such a case the questioner has had to wait in many cases over two weeks and more, and often a question is such that it requires more particulars. Therefore we respectfully ask our readers to give us their full address, which is not necessarily for publication.—Editor.



Useful Gas Heater for Soldering Iron.



Face the Situation with Courage and Confidence

¶ In view of the events taking place in Europe, which will constitute an epoch of perhaps unprecedented importance in history, we appeal strongly to all Canadian business men and all who hold securities or investments of any kind, to meet the present situation with calmness and confidence. Our first duty, at any cost, is to aid in Great Britain's sustenance and defence, and our next duty, not less important, is to keep the business of the Dominion moving as normally as possible.

¶ "In the unprecedented and critical situation that exists," says Sir George Paish, in the *London Statist*, "we would make a special appeal to the patriotism as well as to the interest of the investing public.

¶ "At such a time it is of the greatest importance that everyone should endeavor to act as if great events were not impending. Were confidence seriously disturbed business would come practically to an end, and our ability to face the difficulties that may be in front of us would be seriously impaired. Therefore, it is of vital importance that, as far as possible, the events that are now taking place should not interfere with the daily life and the daily work of the nation. Orders should be given, factories should be run, and everything should be arranged to maintain, as far as possible, the productive power and the income of the country.

¶ "Yet for this to be accomplished the situation must be faced with courage and confidence on the part of everyone. Investors must continue to invest, bankers must continue to lend, the Stock Exchange must continue to deal, and everyone, according to his ability, must endeavor to work hard in order that individual incomes, and therefore the income of the whole nation, may be maintained at the highest possible level

¶ "A little over a century ago, when the nation was at war with Napoleon, its income was a very small one, being less than one-eighth of what it is at present, and in a comparatively short space of time the British people succeeded in raising about £1,000,000,000 of money for war purposes, and so great was their confidence and courage that at the end of the great war, which severely taxed their resources, they were stronger and wealthier than they had been at the beginning."

How to Develop Four-Piece Tapered Elbow

Sheet Metal Problem Showing How to Develop a Four-Piece Tapered Elbow, the Taper Running Straight Through the Elbow.

By E. Newton.

TINSHOPS.

IN the problem presented here we show how to develop a 4-pieced tapered elbow, the taper being straight through the elbow. Such being the case, the pattern required is a section of a cone. To lay out and cut the pattern proceed as follows:—In Fig. 1 we show a side elevation of elbow when completed. Draw a straight line as shown in E F, length being equal to A B in Fig. 1. From E and F and at right angles to E F erect two lines any length, as shown by dotted lines in Fig. 2. This will form an elevation of a straight pipe, the diameter of the large end of the elbow. On this elevation as shown by G, E, H, and F, mark off the sections of a four-pieced elbow, as shown by lines K, L, M, N, and P R. At the end of elbow as laid out and from the center between G and H mark off the diameter of the small end of the elbow, as C D in Fig. 1. Connect points E and F to C and D on line G H continuing lines

until they meet at point X, their union making an elevation of the cone complete. On the base of cone E F draw a half circle, with dividers or compasses, and divide into a number of equal parts.

Placing side of square on line E F, connect points or divisions in half circle to base line E F. Connect points thus obtained on line E F to point or apex of cone intersecting the lines K-L, M-N and P-R. At right angles to G-E or H-F draw lines through the intersection of the lines P-R, M-N and K-L with the lines numbered 1, 2, 3, 4, 5, 6, 7, 8, 9, continuing them through until they meet the outside line of the cone, as C-E or D-F.

With X as a center and X-F as a radius strike an arc, running it out some distance. From point X draw a line cutting arc as in line X-1 in Fig. 3. Beginning at point 1, lay out a stretchout of base of cone as shown by divisions 1 to 9 on the half circle. Connect points of divisions on large arc to point X.

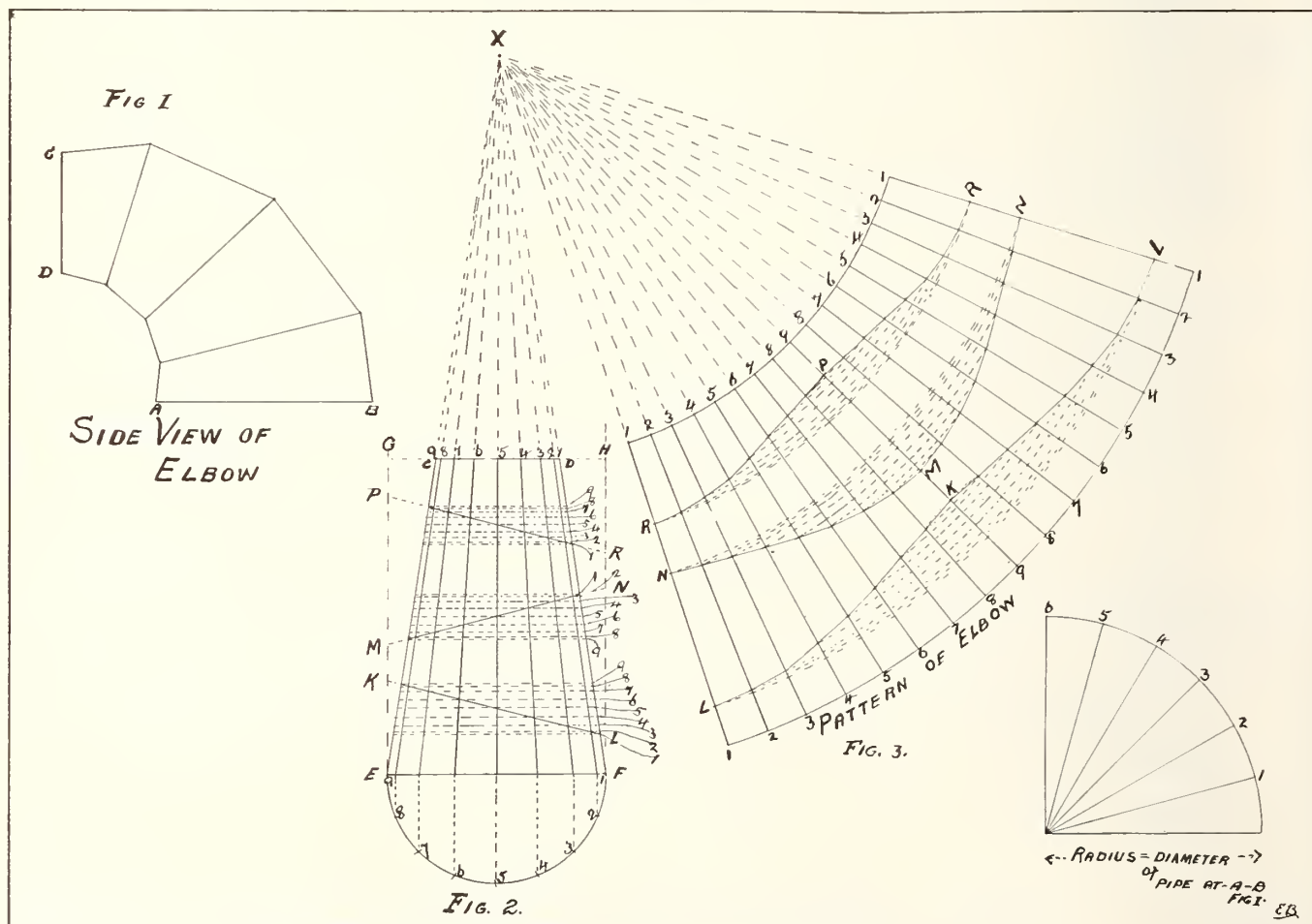
Number these lines to correspond with lines at base of cone.

Using X as a center, make the various arcs from the points at side of cone, the arc from 1 being marked on line 1, from 2 on line 2, from 3 on line 3, and repeating until all the lines on the stretchout are bisected by an arc drawn from corresponding number at side of cone. A line drawn through the intersections will give the lines K-L, M-N and P-R on pattern.

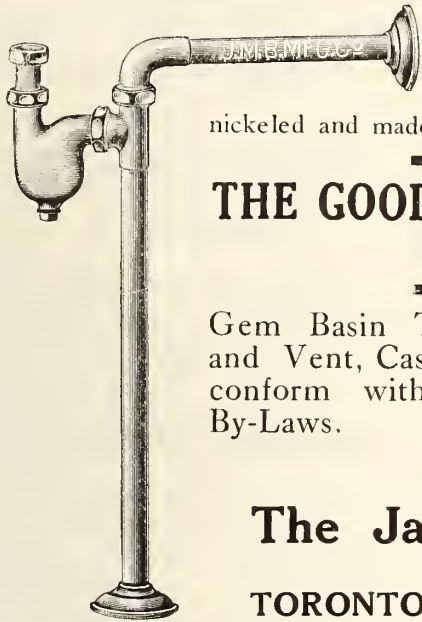
In Fig. 4 is shown the division of a quarter circle into the required number of parts to give pitch for a four-pieced elbow.

New Brass Shop Department.

The Montreal Sheet Metal Works Co., have opened a well-equipped shop at 14 Guilbault street, Montreal, off St. Lawrence Boulevard, to fill contracts for work in brass, copper, German silver, tin and sheet iron. A. Thivierge is manager.



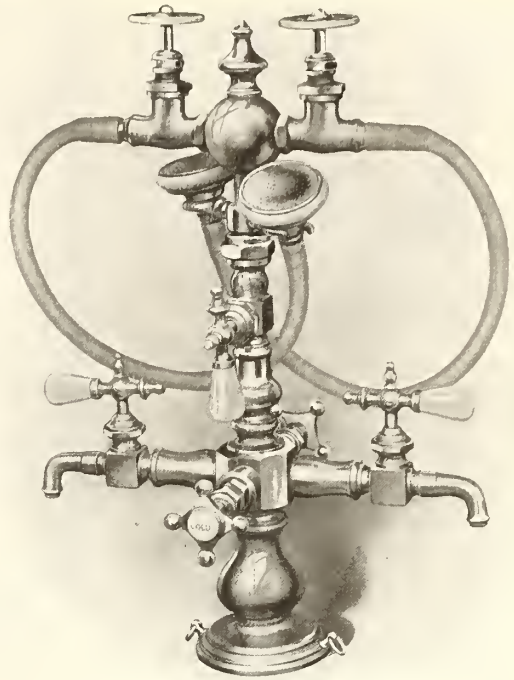
The J.M.T. Line Plumbing and Sanitary Brass Goods



J.M.T. No. 8 Combination and Fuller Shampoo Cock, with Shampoo Rose and Tubing. A most useful combination, extra heavy nicked and made to wear.

THE GOOD SUBSTANTIAL KIND

Gem Basin Trap, Ground Joints and Vent, Cast Brass, and made to conform with Toronto Plumbing By-Laws.



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The James Morrison Brass Mfg. Co., Ltd.

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TORONTO

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Our Mixed Metal Sales Amount to Over \$5,000,000 Annually



THE RESULT OF QUALITY

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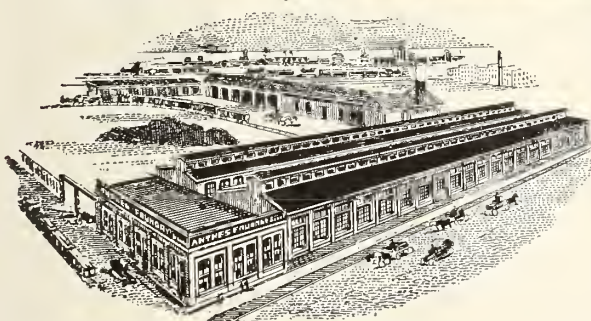
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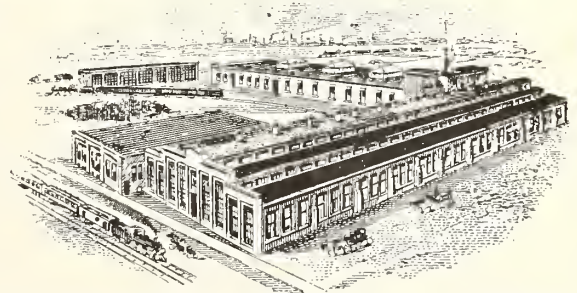
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The
Condensed Ad.
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will interest you

Sani-Flush

thoroughly cleans the
water-closet Bowl
and Trap

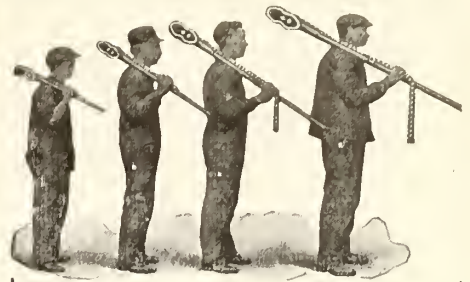
It is impossible to get at the dirty trap with a rag or brush, and dangerous acids will not remove the incrustation of dirt in the trap. A little of SANI-FLUSH (a white powder) sprinkled in the water which stands in the bowl will loosen the incrustation so that it can be easily flushed out.

If the housewife uses a little SANI-FLUSH every day or two she will always have a perfectly clean, white, sanitary closet. SANI-FLUSH won't hurt the plumbing connections and won't craze the bowl. It does not harm the hands because the hands need not touch it. No scrubbing required. It's a very profitable proposition. Write for full particulars.



The Hygienic Products Co.
Dept. "S"

118 Eighth Street, S. E.
CANTON, OHIO.



"VULCAN"

Name your choice clearly

Your call in either way is sure to satisfy. Both tools, thoroughly tested before their sale, are bound to supply first-class results when in operation.

"Agrippa" Chain Tools, universally good for both pipe and fittings, have plainly indicated their worthy qualities in all kinds of work. Get one from your dealer and satisfy yourself of its Single-Jaw-worthiness—trial free!

Vulcans set the pace, kept up the pace and always will keep at the pace for all Chain Wrench work.

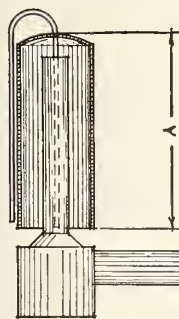
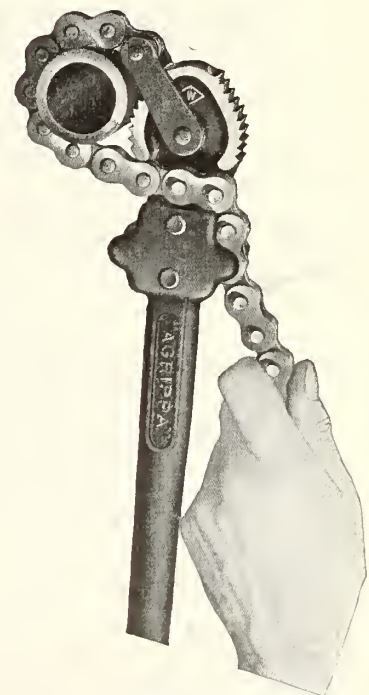
All Tools guaranteed. A choice is simply your declaration of different working-conditions for yourself. In either case perfectly safe and good.

J. H. WILLIAMS & CO.

Superior Drop-Forgings

77 Richards St., Brooklyn, N.Y.

"AGRIPPA"



MEARNS' SIPHON FOR SEPTIC TANK

This Siphon has no springs or valves—
There is nothing to get out of order—
Once installed will last practically for ever
without any attention—Endorsed by Prof. Starkey of McGill University, Montreal.

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In buying plumbing goods you want material that is absolutely dependable—you want your patron to get the maximum of service and satisfaction at the minimum upkeep cost.

YOU will get these things beyond the shadow of a doubt any time you use

Mueller Colonial Self-Closing Faucets

These goods are unequaled in metal, mechanical principle, workmanship or wearing qualities. This is no unsupported statement—owners and managers of big buildings and plumbers tell us so.

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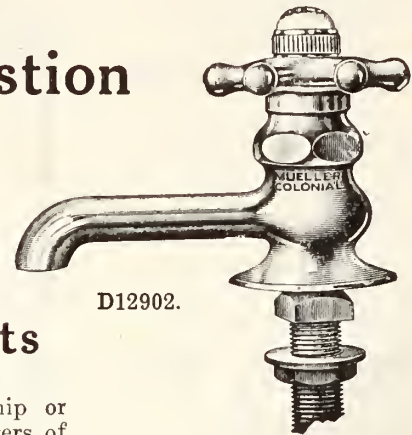
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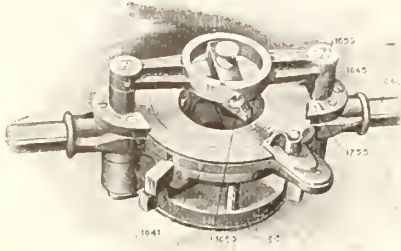
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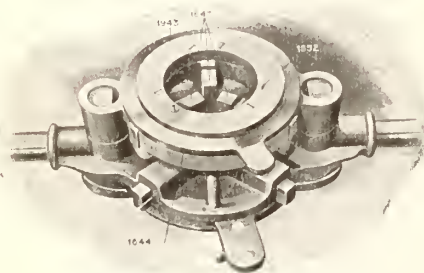
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The off-set die enables you to accomplish by going over pipe once, what any other make would do in going over twice.

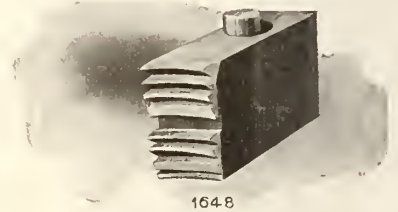
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TORONTO, ONT.



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Two Dies in One

G.M.C. WATER SYSTEMS

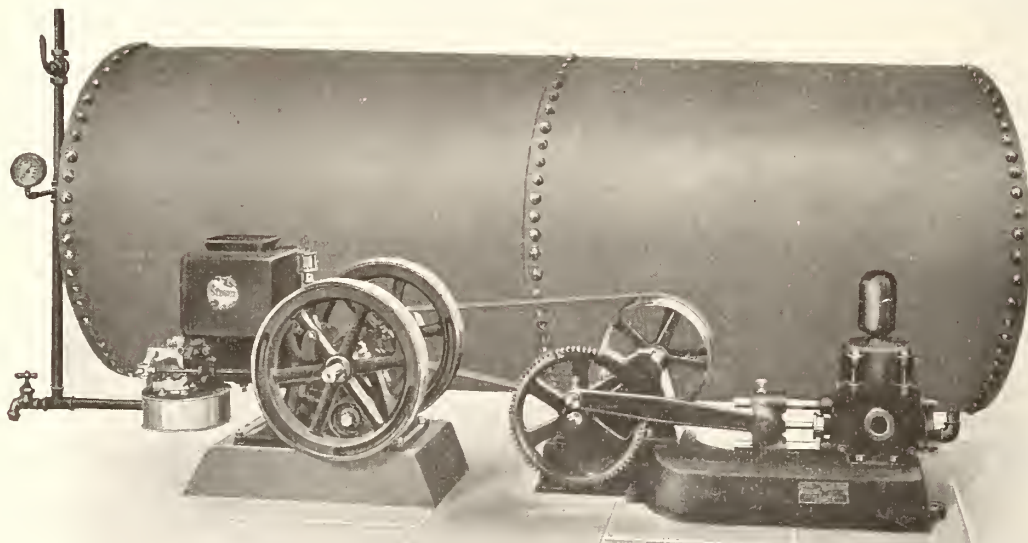


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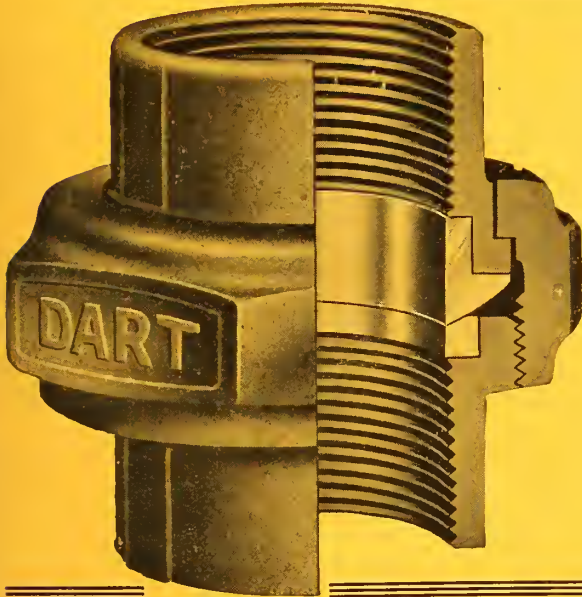
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66

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UNIONS



will not corrode at the joint
because both faces are of Bronze

They Save

Time and labor—and Customers

The Ball-shaped joint enables you to make connections **easily and quickly**, whether pipes are in or out of line.

Dart unions **never leak**, for they stay tight until deliberately loosened with a wrench.

Your guarantee: Every "Dart" union bears our trade-mark and will be replaced two for one if defective.

Sold by Jobbers throughout Canada

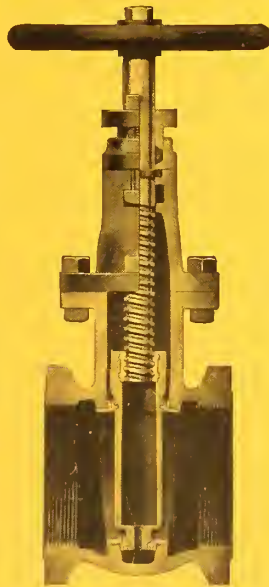
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If you have been using them, we are confident that our satisfaction will bring us your repeat orders. These valves will never cause you or your customer the slightest trouble. Their high quality is consistent.



When you buy a "KERR" Valve you get a guaranteed article that is backed by a reliable firm. Many of the largest distributors of valves in Canada have sold "KERR" Valves for over 25 years, and are still recommending them as the "Best Valve."

Write us for particulars.

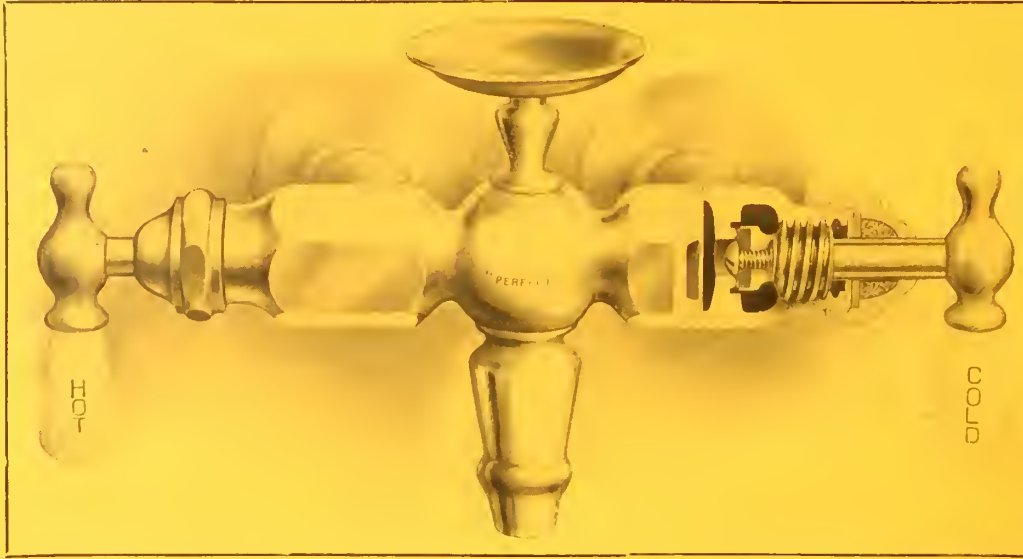
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Valve Specialists

Walkerville, Ont.

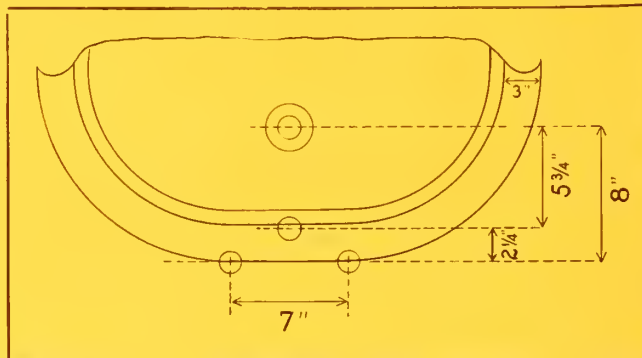
THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

GALT BRASS



"PERFECTO" (REG. 1913)

Use The "Perfecto" when in a hurry—
Saves half the time and all the worry.



"ROUGHING IN"



THE
"PERFECTO"

BATH COCK is a modern achievement in the quick-pressure or rapid-opening type, giving you lever action, and largest waterway made, coupled with a very attractive design.

COMBINATION WASTE AND OVERFLOW—Heavy cast parts, being adjustable, you have no tubes to cut, making it a great time saver.

SUPPLY PIPES are 3/8-inch iron pipe size and weight, seamless, annealed, offset, one piece of metal with expanded collar supporting conical rubber washer, and threaded at floor.

"ROUGHING IN" will, we trust, be of convenience to you. (All our other styles rough in the same as the "Perfecto.")

GUARANTEE—Same as we extend on all goods bearing our name.

SEND US YOUR ORDER NOW.

GALT, CANADA

BATH SET

THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

Publication Office : TORONTO, OCTOBER 15, 1914

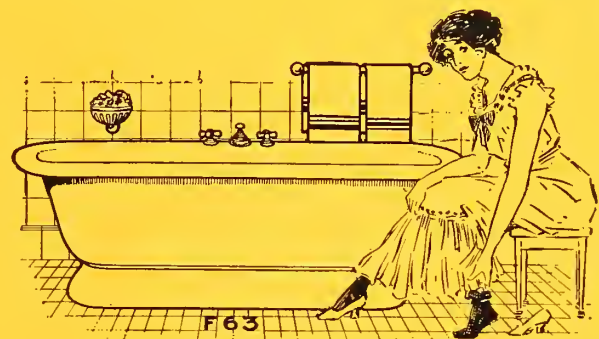
No. 20

WAR AND BUSINESS

If the bottom of the Canadian Business "Bucket" should drop out now, and with it, our courage and confidence, how will we be able to profit and how will we be able to grasp the tremendous opportunities that await only the final triumph of our soldiers on the Battlefield in Europe? If we go to sleep now and calmly await the "knock" of old Opportunity, we may hear the "knock," but we won't be able to hold our end up with the fellow who is keeping in "trim" and trying to keep his business going as usual.

The war caused the postponement of many improvements that otherwise would have helped your business and ours. This business isn't lost, but we must go after it to get it. Now is the time to advertise, to work to boost it till you get it coming—after you.

Below we reproduce two electros we have made up. We have several others also, any of which we will furnish free if you will use them in your local advertising.



Made in Canada—Our duty to the Empire

—To patronize home products and help home industries whenever possible, but always when the home product is as good as the imported, at about the same price.

STANDARD IDEAL WARE is made in Canada—none better is made anywhere. We haven't raised our prices on account of the war, and we're keeping our factory working during the present Crisis.

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76-82 Lombard St.

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THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.

These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

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General Offices and Factory: Amherst, Nova Scotia

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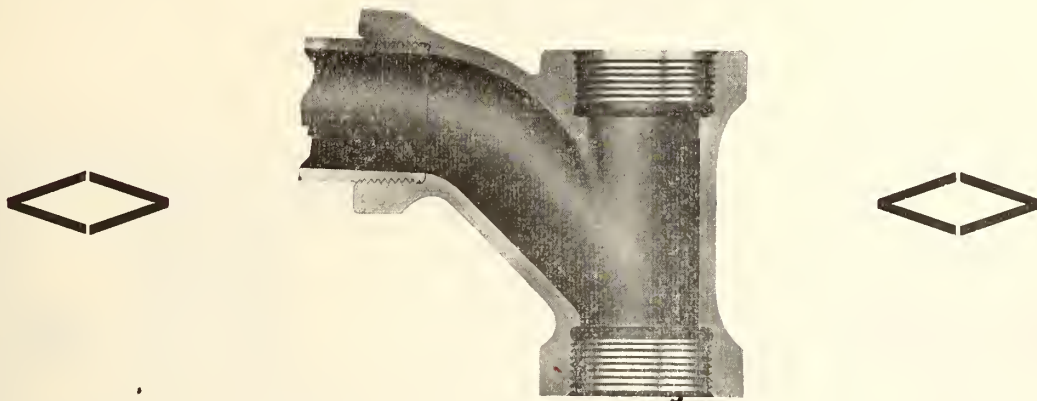
ONTARIO:
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TORONTO

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Trade
Q-T

Mark
(QUARTER TURN)

HOT WATER RADIATOR VALVES

(Patented)

FILL A LONG-FELT WANT

We are the ORIGINATORS, SOLE MANUFACTURERS and PATENTEES of the Genuine Q-T (Quarter Turn) Hot Water Radiator Valves fitted with INDICATING T-HANDLES

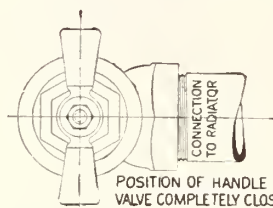
The Trade Mark Q-T has been registered to protect users from imitations which may be put on the market by manufacturers of inferior goods.



Fig. 450

Q-T Valve with
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Sold by principal Jobbers and Manufacturers of heating apparatus

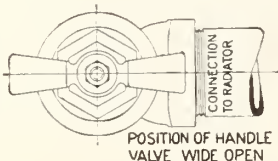


You can tell at a glance whether the Valve is open or closed.

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Guaranteed full opening—equal to the nominal diameter of the pipe.

Q-T Union Elbows - - - Fig. 452

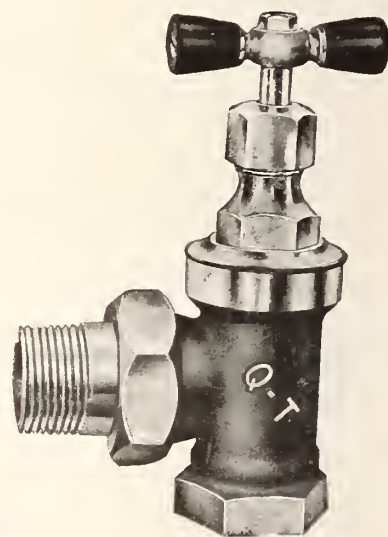


Fig. 451

Q-T Valve with
male union

Endorsed by the leading Architects and Engineers

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THE DAISY BOILER

**Over 55,000
DAISY
Boilers**

are giving the best of service throughout Canada.

The Daisy has qualities which make it a better proposition than any other on the market.



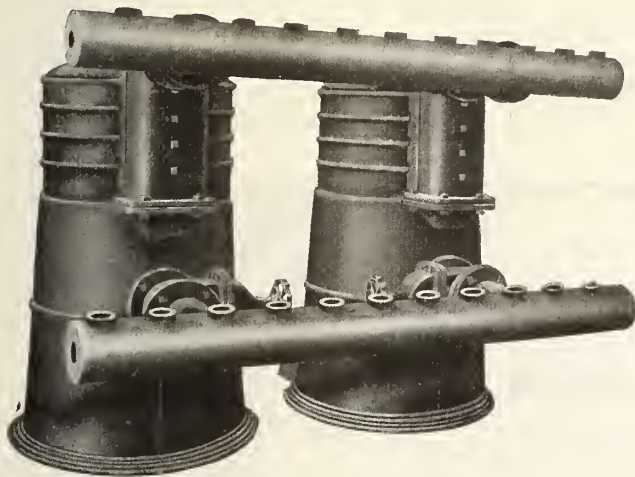
Made in the best equipped plant in Canada.

Without doubt the most popular boiler made.

Every installation means another customer satisfied.

Minimum consumption of fuel.

Maximum amount of heat.



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Annual Subscription \$3.00 the Year.
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THE FINANCIAL POST of CANADA

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The
Condensed Ad.
page
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Sani-Flush

—IS THE REMEDY

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The only
which
can't clean
except with
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The Hygienic Products Co.

Dept. S.

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"Standard Sanitary" Plumbing Fixtures can be obtained anywhere in the Dominion. They are handled by leading Plumbers throughout the provinces and are carried in stock by Jobbers and Sales Agents throughout the Dominion of Canada, thus facilitating prompt deliveries.

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Note:—Beauty of design and construction.

The handsomest and best bath cock on the market.

Furnished with brass handles also if so specified.

Made in Canada.

Price Reasonable.

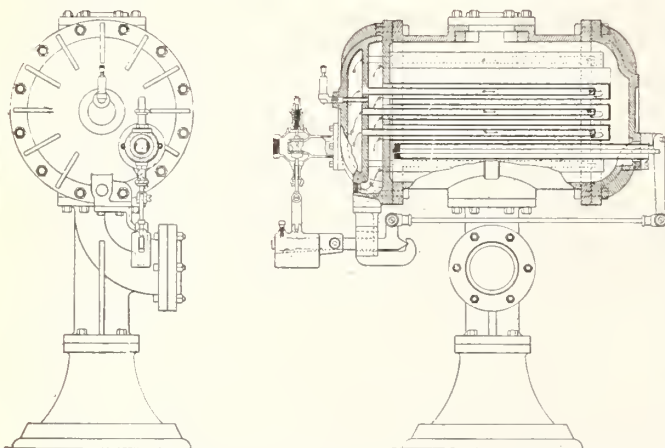
Nough Said.

Manufactured by

Canadian Wolverine Company, Limited
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The "Manny" Heater

Affords Every Aggressive Steamfitter An Excellent Opportunity to Make Large Profits



The Manny Heater is connected to a hot water system as the ordinary hot water furnace, and steam is carried to it from a boiler house stationed outside the main building, at regular boiler pressure, but reduced at every heater by a steam pressure reducing valve to 20-15-10-5 lbs., or as low as one pound to the square inch, according to temperature required in the building. The steam is carried to the Manny Heater from the boiler room through underground pipes.

There isn't a better or more economical way of heating large buildings. Many furnaces can be eliminated and much space saved. Supplied with or without Thermostats. Notice how provision is made for the expansion and contraction of tubes—Threaded Joints.

Let us give you full particulars, regarding this newest and best method of heating. Write for descriptive catalog F.

The E. S. Manny Co., Montreal

300,000 lbs.

carried in stock for immediate
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Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

Brass and Copper Rod.

Brass and Copper Sheet.

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This letter is not about buying, but selling. It is intended to start a train of thought, not to advance any radical ideas.

The Retail Merchants of Canada have more to do with commercial prosperity in this country than any other class. Do you acknowledge this responsibility? What are you doing in this present crisis?

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You can help your country, in fact the most patriotic thing you can do will be to recommend Canadian-Made or Empire-Made goods at every opportunity. When a man comes in for a package of tacks, or an electric fixture, try and sell him something made by Canadian workmen. If men are walking the streets this Winter, the Country will not see them starve—you and I must help keep them.

Instancing the Gas Range Line—we speak of a line we know about now—if foreign-made Gas Ranges were eliminated from the Canadian Market, every Canadian factory would be working overtime. You see the point—not only *talk* "Made in Canada," *act* it.

Gurney-Oxford Heating Goods are, of course, "Made in Canada," and we want you to sell them of course, but if you do not handle the Gurney-Oxford line, handle Canadian Heating Goods, and your country will be the richer for it.

The policy we have outlined has built up Germany commercially, in the face of the heaviest military handicap of any modern nation. It is building up other countries to-day. Will you help build up Canada? Let's build together.

The GURNEY FOUNDRY CO., Limited

ESTABLISHED 1843

Toronto

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Canada

Messrs.
BRUNNER, MOND
& Co., ENGLAND,
Have the finest Industrial Bath Installation in Europe.

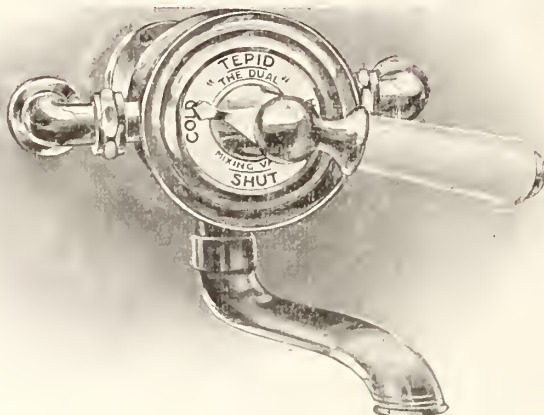
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are provided for.

This is the Valve
used.

Made in England
by GUMMERS Ltd.,
ROTHERHAM

THE DUAL VALVE IS THE FINEST MIXER YET PRODUCED



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It can be taken to
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Made in various
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making up sets.

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Canadian Agent

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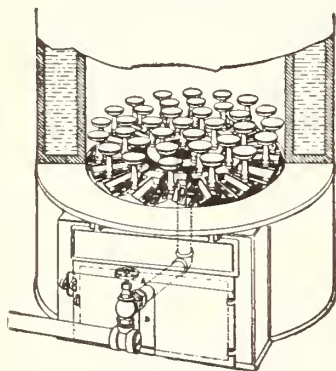
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Works: Lachine Canal

In a Round Boiler.



"Standard" Gas Saving Burners

Every Plumber or Gas Fitter is interested in applying the **Right Burner** to the heater used for warming—that is: the Steam or Hot Water or Hot Air Furnace whether it be in the house, the church, store, school building, or other buildings.

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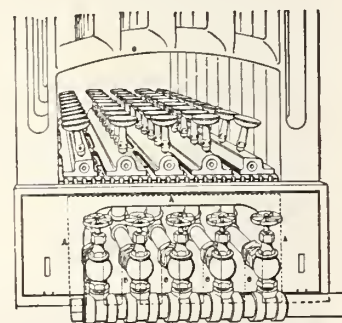
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Standard Heating & Radiator Co.

Manufacturers

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In a Square Boiler.



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Sizes from $\frac{3}{8}$ to 4 in.

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Gas Companies and the Public demand a Strong, Durable Gas Mantle with a high candle power, and at popular prices. The Trade can now absolutely rely upon being able to supply such a mantle in the Laddite.

Awarded Gold Medal
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1908.

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Full particulars of the merits of the Laddite, together with terms for wholesale and retail trade, furnished on application.

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LIMITED
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MADE**

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We hear much to-day about "efficiency" in business.

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A half-century's use — at a present rate of 50,000,000 each year—is positive proof that these famous files cut deepest—work fastest—last longest—and cost least to use.

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"FILE PHILOSOPHY"—A 50 years' education on files in an hour, and our Catalogue, sent **FREE** on request.



SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, OCTOBER 15, 1914

No. 20

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C 52 illustrates the Bellwood C 52 Syphon Jet Closet, with No. 5 White VITRO tank, Hercules reinforced Birch Mahogany post, hinge seat and cover, with cast brass floor flange and rubber gasket, N.P. closet bolts.

PLATE C 50



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Guarantee

A new tank will be given to replace one that at any time proves defective from either material or workmanship.

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**Cluff Manufacturing
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PLATE C 52



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MADE IN CANADA STEEL AND RADIATION, LIMITED

These **PLANTS** are devoted exclusively to the
manufacture of the famous



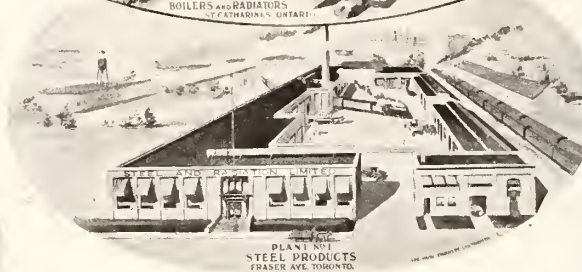
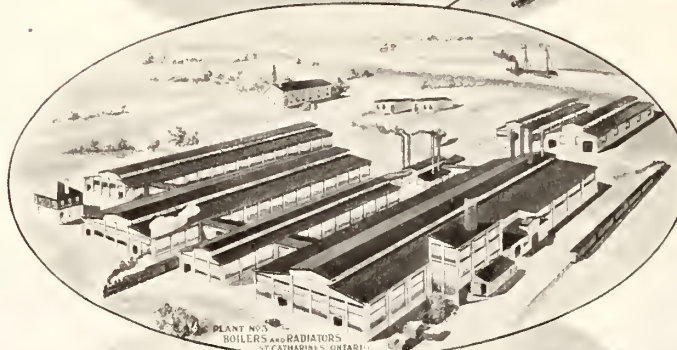
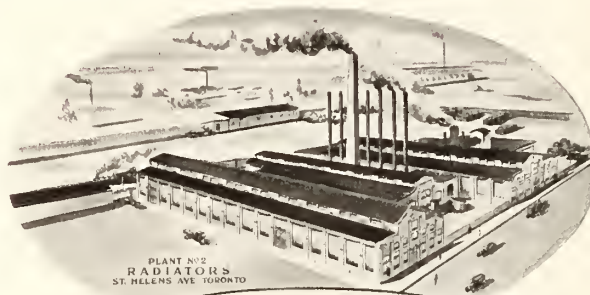
"KING" Boiler.

Our Products are designed and manufactured in our own plants and by our own efficient staff of Engineers and Skilled Mechanics.

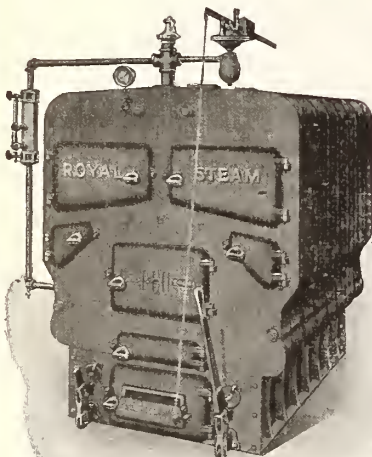
- "King" Hot Water Boiler
- "Royal" Round Steam and Water Boiler
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- "Royal" Tank and Laundry Heaters
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"KING" Radiator



Insist on having these **Canadian** made goods installed on your contracts.

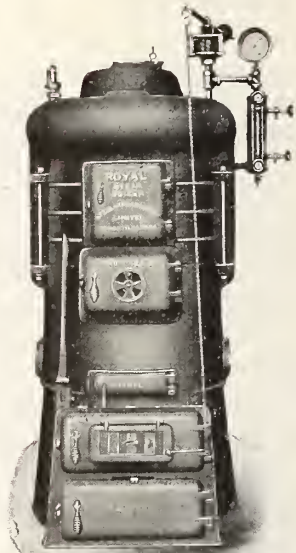


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STEAM.

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Prompt Delivery.



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THE SANITARY ENGINEER

VOL. VIII.

OCTOBER 15, 1914.

No. 20

Simplified Sanitary Engineering Construction

A Discussion on Simplified Methods of Piping and General Construction in Sanitary Engineering. With Quotations From Expert Authorities. A Topic of Unusual Interest.

IN our last issue we took up the problem of simplified construction of piping in sanitary engineering. We intend publishing a regular series, and we shall in future issues compare the methods which are at present generally demanded by the boards of health, with a simpler yet more efficient method.

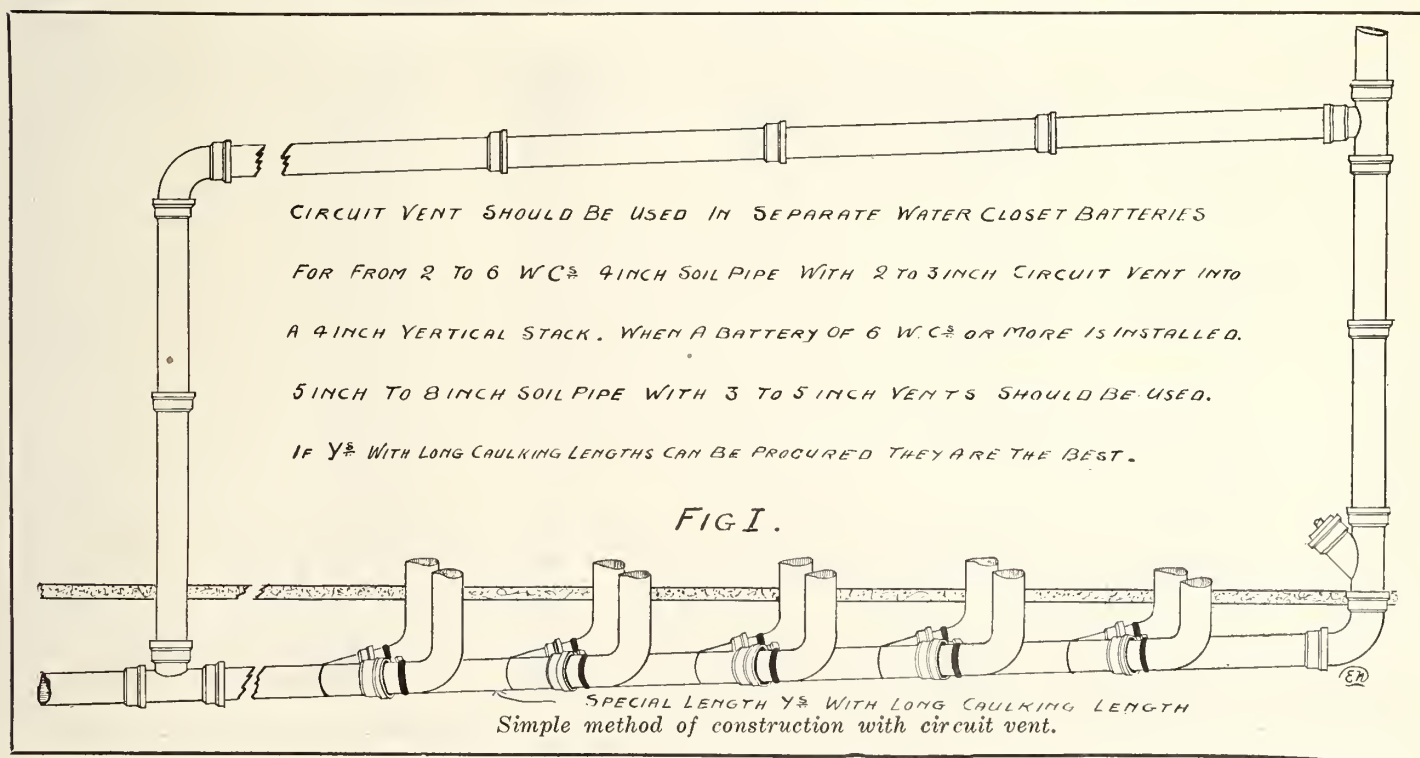
In our last issue we quoted from a chapter on simplified plumbing by Dr. Paul Gerhard, S.E., New York, who is an authority on sanitary engineering construction, and we are continuing Dr. Gerhard's remarks under another heading on another page of this issue.

We intend taking up in this issue the back-venting of w.c. when in battery. Fig. 1 shows a partial battery which may be extended, but which simply shows ten w.c.'s, together with what is called a circuit vent, and is carried from a point next to the last w.c. on the line. This circuit vent will answer the purpose of the most expensive system of back-venting, and to it there can be no objections whatever. Fig. 2 shows the method which is most popular in Canada, and is demanded by most boards of health.

There we show the two methods as it were side by side, and when such a picture is placed before one's mind's eye the facts are more apparent. Of course, we know that some time ago there were w.c. bowls which to some extent would syphon themselves when installed under certain conditions, and that in many cases the back-vent was necessary. But to-day w.c. bowls are of more modern construction, and will not syphon themselves. They are, moreover, fitted with flush valves that have a re-filling arrangement in connection, so that should there be a condition where a w.c. bowl may partially syphon itself, the re-fill will take care of the trouble.

Then, again, this is an age of progress; it is a period when we should not wantonly waste either labor or material. We should take note that waste of any kind is an economic loss to the universe. To make a simple wiped soldered joint which contains 1 oz. more tin and 1 oz. more lead than required is a waste. To put in one foot of pipe more than is necessary is a waste. It will rebound upon trade. If the general construction

of sanitary pipe lines can be simplified, it is the duty of every sanitary engineer to see that it is done, and the craft would then be credited with progressive ideas. A sanitary engineer who objects to simplified methods because such methods will cut out a large per cent. of business is, to say the least, dishonest. He is preying upon the innocence (not ignorance) of his customers. Of course, we are well aware that the sanitary engineer is bound by certain by-laws, and must abide by them and carry them out to the letter. But men make these by-laws; men who are not in every sense of the word as practical as they should be. If we were to read or, rather compare, the various plumbing by-laws we should find that there is very little originality about most of them. They are almost all copied one from another, simply because when a town becomes incorporated and plumbing by-laws are to be instituted, a committee is formed to visit another town, or consult the by-law in vogue there, and these are copied as nearly as possible. What is wanted is a practical man on the board of health,



one who has had some years' experience, and is at heart a good citizen. Such a man would no doubt see to it that the very best practice was followed out, and be ever on the look-out for progressive methods to keep his by-laws up-to-date. He would be able to look into the matter of licensing only practical men to engage in the plumbing business. At this period, as we stated before, almost every city is considering the subject of uniform by-laws. Therefore, such being the case, it behoves every man, whether he be a journeyman or employer, to do all in his power to improve as well as simplify sanitary engineering construction, and to see to it that, while keeping uniformity in mind, the code should be so arranged that each city can overcome any trouble due to the different climatic conditions felt in the various parts of the Dominion. What is needed more than all else is a standardization of fittings and a greater variety of soil pipe fittings, which would simplify construction. There should also be a department in our board of health offices whose duty it would be to grant permits for reconstructions and new work, plans to be submitted before permits be granted. Each board of health should supply charts to the trade as a guide to the sanitary engineer. Such plans would be a boon to the trade, and a permit being granted to construct certain work, the charts would show how certain connections should be made.

UNDERGROUND GARBAGE RECEIVER.

The Majestic Company, Huntington, Ind., have placed on the market the Majestic underground garbage receiver here illustrated. The makers state that many unsightly and unsanitary back yards and alleys are caused by nothing less than inadequate means for taking care of cans and receptacles for holding garbage or



Majestic Underground Garbage Receiver. showing how hopper is operated.

burning waste paper and refuse that these objectionable features can be eliminated by using underground receivers. The receiver is described as follows:—

The body of the outer can is made of 16 gauge American Ingot Iron, and will

not rust in the ground. The cast iron top consists of a single casting (which is lifted from the iron shell or outer drum for the removal of garbage can by the collector) with a hood-shaped top, which holds the removable hopper, the hopper always remains closed when not in use, preventing any danger of entrance of mice, rats, dogs or cats, or escape of odors, and is absolutely fly proof. The hopper can be opened easily by the foot, and just a little kick will shut it easily and quickly. No need of touching with the hands.

The inner garbage can is made of galvanized iron, in 12-gallon, 16-gallon and 30-gallon sizes, to suit the requirements, ranging from that of small families to restaurants and hotels.

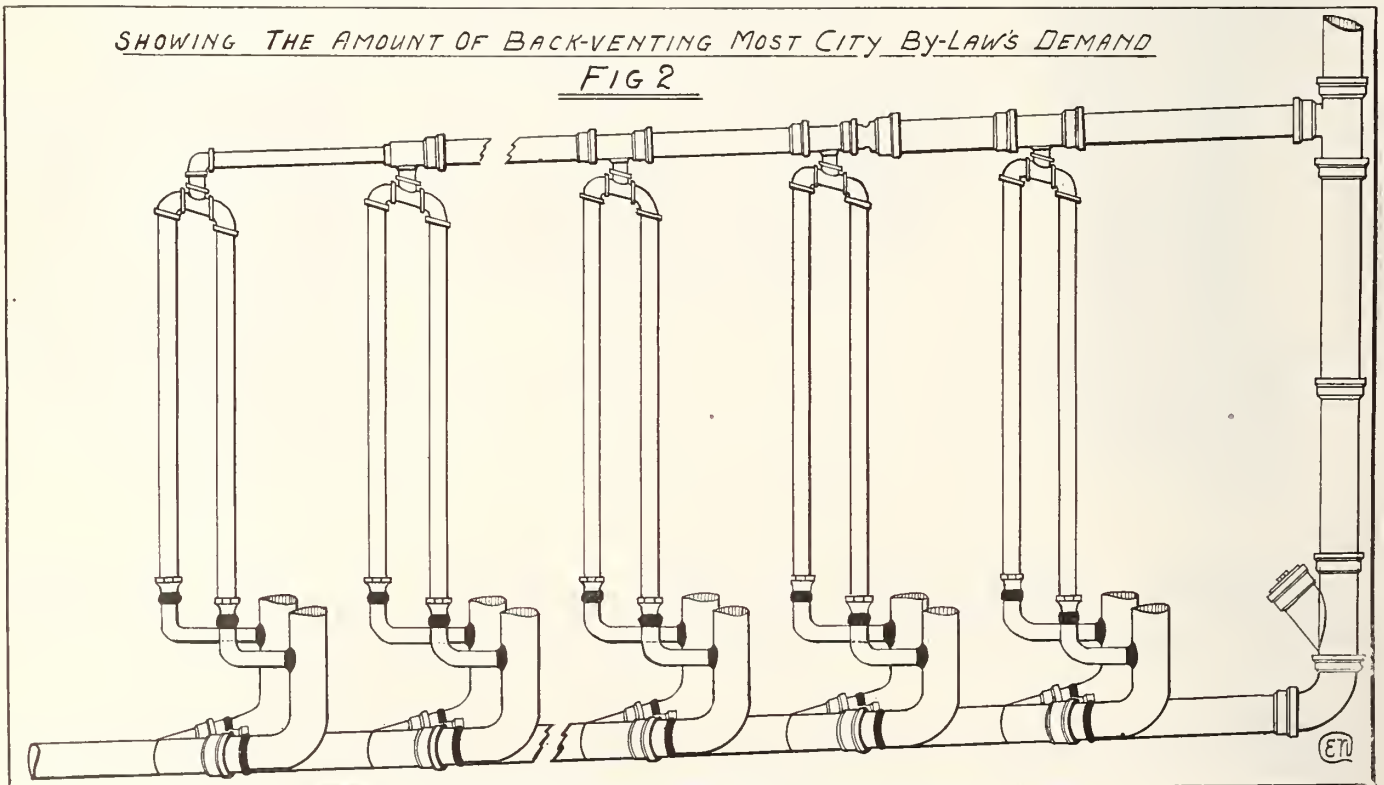
The No. 2 receiver can be used for burning paper and refuse, and contains a cast iron receptacle for holding the ashes that accumulate. The ash receiver can be taken out by means of a bail and ashes emptied into can.

SAVING ON TRIFLES

A telephone call when a letter will do; twice the paper or twine that the package can use; an errand boy's five-minute job done by an eighteen-dollar clerk; an order neglected until an apology or a special delivery stamp or a telegram is essential; these and their kin are such trifling matters and are happening with much frequency, but is not your business built on profits often as small as these assumedly inconsequential matters? Any kind of waste is just so much money thrown away—and you are not yet rich enough to do that—probably never will be.

SHOWING THE AMOUNT OF BACK-VENTING MOST CITY BY-LAW'S DEMAND

FIG 2



Complicated method, costly and not necessary.

Heating and Ventilation Past, Present and Future

These Articles Will Take up the Simplest Methods Adopted in the Past, the Present and the Possible Methods for the Future, and Will be Written as Free From Technical Phraseology as Possible, so as to be Within the Scope of the Lay Mind.

W have already dealt with this subject under the above title, but only took up the various methods adopted in warm air heating and combination warm air and hot water showing the principle embodied in these methods of heating. We do not propose to recommend any particular system by any means, but simply to take up the various systems, stating various claims made by those who have adopted them. It is well known that the warm air method of heating has been anything but desirable. It has been neglected, impractical men have installed these warm air furnaces, and on the whole have gained for this method a poor reputation as regards practical efficiency. Such need not be the case by any means if the system be properly installed upon practical lines. If the furnace be large enough, and designed upon practical lines, such an installation could be highly commended under certain conditions. Cost of installation would not be quite so high, though no doubt higher than some of the work being done at present.

The next in cost of installation would be that of a one pipe, dry return steam system. Often this kind of a system is called "A one pipe system pure and simple." However, there must be some method of return, and that method must involve a return of some kind.

Fig. 1 shows the principle of a one pipe, dry return steam system. It will be seen that the main steam is taken off the top of the boiler, and run up to the highest point, then a fall of not less than one inch in ten feet is allowed from the boiler, and on reaching the last radiator a separate dry return with the same fall to the boiler is allowed. On reaching the boiler this pipe should drop vertically to the bottom of the boiler. In installing a steam system of this kind there are several very important things to consider. No branches should be taken off the mains except at an angle of 45 degs. from the center. This should be done as shown in Fig. 2. Both the mains and branches would require to be one size larger than would be used with a two-pipe system. There should be as few radiators as possible taken off one branch. Separate branches for each radiator are preferable. All pipes should be reamed, or better still, cut with a pipe cutter which

CAREFUL, CAUTIOUS AND CANNY

In Canada it was all right for manufacturers to pause when the tumult and confusion of war shook the ground beneath their feet and unsteadied them. But it is not all right for Canadian manufacturers to go into temporary or permanent hiding at this time of national necessity and opportunity. On the contrary, it is time for a broad forward movement.

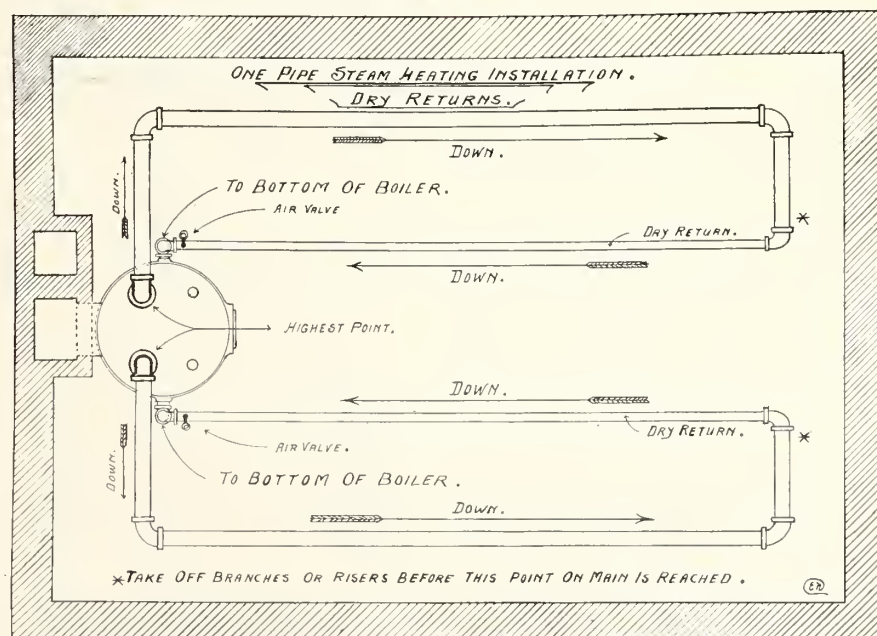
The man who shrinks from battle, even though the forces opposed may appear overwhelming, takes away from the strength of his comrades. If he deserts, dire punishment is meted out to him. Winning or losing, battle-time calls for men who will fight until overthrown or slain. The careful, cautious, and canny man—manufacturer, wholesaler or retailer—never rises to be a great merchant.

When the war is over, the honored and rewarded men among soldiers and merchants will be those who never faltered, who kept their face to the foe, and who fought dauntlessly to the very end.

The valiant-hearted business men of Canada—retailers, wholesalers and manufacturers—are advertising NOW

leaves no burr on the pipe, thus saving the necessity of carrying a set of reamers, as well as loss of time. A reliable air valve must be attached to each radiator, one which acts quickly to avoid leaking of steam, and will open with air and close of steam.

All reducing tees used should be what are known as eccentric tees. These latter points require to be strictly adhered to or the steam in the radiators will be too wet, and wet steam is not as good a heating medium as dry, hence it will be seen that a one-pipe system, such as here shown, may have the advantage of being less costly, yet at the same time not have the same efficiency as other well-known systems of the two-pipe kind. Another very important point must be watched, and that is, that no branch which runs for any number of feet horizontally must have more than one inch in ten feet of a pitch down from the radiator. Particularly if there is an elbow at the lower end because, the condensation is apt to flood the elbow, and in many cases cause hammering, long sweep elbows are suitable for such a condition. In fact, if heating engineers could realize the amount of friction caused in pipe lines and fittings, by the short elbow and tee, there would be more long sweep elbows and teapot tees used.



Practical Course for Sheet Metal Workers

Article No. 3 of Series

By CHARLES SEIVERS

A circle, with its diameter, radius, etc., has already been defined in a previous article; we will now give some further definitions with regard to a circle.

A Semicircle.

A diameter of a circle divides it into two equal parts. Each part is called a semi-circle or half-circle, as at Fig. 1. The diameter A C divides the circle A B C D into two equal parts, as at A B C and A C D.

Concentric Circles.

Concentric circles are those which are drawn from the same centre, as at Fig. 2. The two circles B-C-D and E-F-G are concentric, both being drawn from the same centre, as at A.

Eccentric Circles.

Circles within or in contact with each other but not drawn from the same centre, as at A-B-C and D-E-F in Fig. 2 are eccentric to each other and are called eccentric circles.

A Tangent.

T tangent. A straight line is said to be tangent to a circle when it meets the circle but does not cut it as at Fig. 3. The line D-E is tangent to the circle A-B-C.

A Chord.

A chord of a straight line drawn through a circle, joining any two parts of the circumference, is called a chord, as in Fig. 5. The line A-B is a chord of the circle A-B-C.

An Arc.

An arc. Any portion of the circumference is an arc, as at Fig. 5. The chord A-B divides the circle A-B-C forming an arc at A-D-B and A-C-D.

A Segment.

A segment of a circle is the figure contained by a chord, as in Fig. 5. The chord A-B divides the circle into two segments as contained by the chord A-B and the arc A-C-B, and the chord A-B and the arc A-D-B.

A Sector.

A sector of a circle is the figure contained by two radii of a circle and an arc, as in Fig. 6. A-B-C is the circle, X the centre, X-D and X-E the two radii; the figure contained by X-D-C-E is a sector of the circle A-B-C, and the figure X-D-A-B-E is also a sector of the circle A-B-C.

KEEP UP THE MOMENTUM.

One of those pessimistic individuals who are going about talking war-time depression was overheard to say:

"Rather than lose money in my business I shall cease spending money on development. I may not MAKE any money during the war—but by great economy in the conduct of my affairs I shall at least avoid LOSING any."

And then he mentioned advertising as one of the things he would do without, until the war is over.

Without going into the merits of his general policy of retrenchment, let us see what happens when such a man stops advertising.

Advertising is most effective when continuous. Its main purpose is to set up a momentum of reputation, prestige, and good-will, that LATER ON creates sales.

So, if a manufacturer fails to keep up his advertising to-day—if he lets the momentum of his business-creating campaign cease—where will his sales be three months or a year hence? What of his business when the war is over? What will it cost him to set the wheels in motion again?

If we believe, and experience compels us to believe, that advertising builds reputation, prestige, good-will—what utter folly to stop the process of that reputation building, just because there's a war in Europe?

A Quadrant.

If the two radii X-D and X-E are at right angles to each other, the sector contained by them as at X-D-C-E is called a quadrant.

An Ellipse.

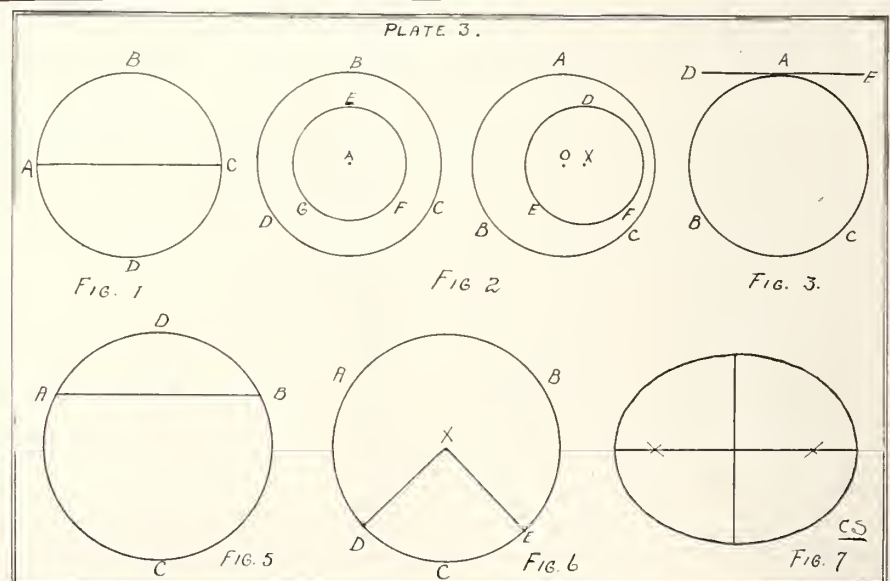
An ellipse is a plane curve of such a form that the sum of two straight lines, drawn from any point into two given points, called the foci, will always be the same, as in Fig. 7.

A Degree.

In measuring angles the term degrees is quite often used. A circle is divided into 360 degrees, each degree being equal. A half or semicircle will of course contain 180 degrees, a quadrant or quarter circle 90 degrees. An instrument used for measuring or laying out degrees or angles is called a protractor and one is usually included in each set of drawing instruments.

NEW CATALOGUES.

The sanitary and heating engineer who has a good supply of up-to-date catalogues and price lists is to be complimented as having a fine reference library. The Smart-Turner Company, Ltd., of Hamilton, have recently issued three new catalogues known as No. 7, 8, and 9. They are beautifully illustrated and describe the various lines manufactured by this company. Drop a line to the Smart-Turner Machine Co., Ltd., 161 Barton St., east, Hamilton, and procure these books.



Analysis of Can. Sanitary Engineering By-laws

Continuing the Above Series We Are Again Taking Up the Plumbing By-Law in Force in Fort William, Ontario, Known as By-Law 1181 With Amendments.

IN this article we will conclude our comments upon this by-law. Up to the present we have taken up the first thirty clauses. We now take clause 31, which reads as follows:—

Clause 31

All plumbing work before being covered or enclosed shall be subject to water test, or smoke, as the inspector may direct, in the presence of the plumbing inspector who shall arrange with the contractor the time for so doing within two working days of notice given. Pipes must not be bronzed until installation has passed inspection."

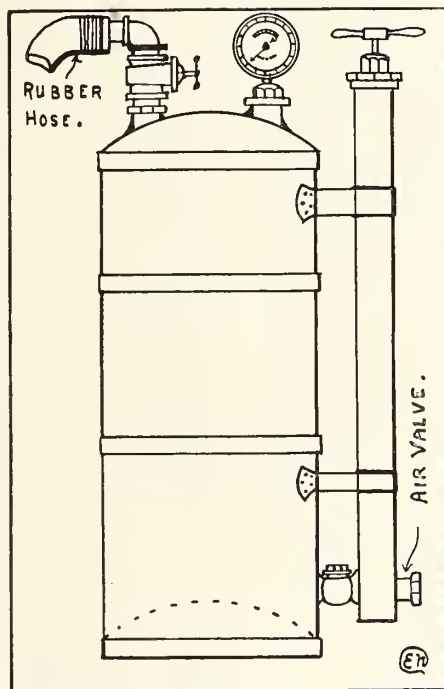
This clause as our readers will see refers to the testing of the plumbing, but, we do not think the actual wording is quite specific enough. It is a well-known fact amongst our craft, that a water test is necessary when climatic conditions will permit. In winter time, when it would be dangerous to enforce it some other test should be resorted to, other than smoke. We are of course referring to the test placed upon the piping, viz. the "roughing in." We do not think that the ordinary smoke machine would permit a severe enough test. A compressor air test would be better. The writer made such a machine and added peppermint into the tank. We are showing in Fig. 1, a sketch of the machine. This was operated as follows:—The top of the stack was plugged with a good test plug and putty filled, the foot of stack was also plugged and a strong hose connected to the cylinder as shown in sketch. About a quart of hot salt and water was placed in the cylinder and the plunger of the pump taken off then about two ounces of spirits of peppermint was poured in, the pump cylinder screwed up and forced into the stack. It did not take long to find out a leak, the hot water very soon caused the spirits of peppermint to evaporate, and the salt would not allow the water to freeze. Then should there be a leak, it would be easy to put the tank over a fire pot to heat up again. However, this clause only demands in actual fact one test, viz.: "Water test or smoke." Now providing the test is in summer, and a water test was asked by the inspector, then according to the wording of the clause, the inspector could not demand any further test upon the finished work. After the fixtures are installed, there is no doubt a smoke, air

or peppermint test is necessary. The writer had an experience in one city where a clause was worded very similarly to the one we are discussing, and he refused to put both tests on. Just by way of testing the clause, and finally the clause in that city was amended, and both water and smoke tests were demanded.

Clause 32.

The next clause is very general and does not need any commenting upon. We herewith reprint it in full.

When defective pipes or fittings are discovered they shall be replaced by sound pipes or fittings and any



other defect made good before another test is made.

Clause 33.

This clause too is simply a reminder that the city will furnish a smoke testing machine, etc., and reads as follows:

All material or labor necessary for making such tests shall be furnished by the contractor executing the plumbing work. A smoke testing apparatus (the property of the corporation) will be kept at the office of the plumbing inspector. The use of such apparatus can be had by the contractor.

Clause 34.

This clause defines the weight per foot demanded for cast iron soil pipe.

Medium.

2 inches diameter,	4 lbs. per ft.
3 " " "	6 " " "
4 " " "	9 " " "
5 " " "	12 " " "
6 " " "	15 " " "

Extra Heavy.

2 inches diameter,	5½ lbs. per ft.
3 " " "	9½ " " "
4 " " "	13 " " "
5 " " "	17 " " "
6 " " "	20 " " "

Water Service Connection.

The following clauses all refer to the water service connections, viz.:

Clause 35.

All connection to the city's service pipe shall be lead until carried inside the building.

Clause 36.

Each consumer shall be supplied with a separate stop and waste cock on service in addition to the city's stop cock, unless water is supplied through a meter.

Clause 37.

This clause refers to the weight and strength of pipes used on a water service.

Pipes may be of lead or galvanized iron, and lead pipe, shall weigh as follows:—

½ inch lead	6 lbs. per yard.
5/8 " " "	8 " " "
¾ " " "	10 " " "
1 " " "	13 " " "

Iron pipes shall be of American standard, tested to withstand a hydraulic pressure of 200 lbs. to the square inch.

The first part of clause 37 is to be commended, and it would be a splendid move, if all Canadian cities would institute such a clause in their plumbing by-laws. In many small towns the pipe is lighter than the lead pipe here specified and lead pipe is expected to stand such variable pressures that it needs to be heavy. The writer has seen as light as 4½ lbs. ½ inch lead water pipes used. It would also be very desirable to insist that nothing less than ½ inch be used. It seems that in times past a great deal of ¾ pipe was used.

Clause 38.

This clause is general and simply lays (Continued on page 24.)

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Plumber and Steamfitter of Canada

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TORONTO, OCTOBER 15, 1914

Our View of the Financial Situation

LAST week we mentioned the fact that there were buildings the value of which would run into thousands of dollars standing in an unfinished state for lack of cash with which to complete them. We pointed out that a great depreciation would take place if these buildings are not completed before the severe winter weather sets in. We also stated that the banker had lost faith in Canadian real estate and indeed they are themselves proving the truth of our assertion. No doubt rents are dropping, but why? Simply because industrial business is being crippled by the attitude taken by the banks, and men are being laid off, or salaries are being reduced, thereby causing men to move into smaller houses. In thousands of cases two families are now living in one house. Such a condition of affairs of course reduces the value of an investment either in residential property, or in store and office buildings, and at the same time decreases the vitality of the race and efficiency of the worker.

If bankers were merely human, they would see how they are crippling the whole Canadian industrial structure. They are making it impossible for manufacturers to grasp the business opportunity which this war has brought to our very door. No, they make too much money in discounting and re-discounting the millions of dollars worth of bills which must pass from nation to nation, when there is a lot of foreign trade to be carried on.

We could go on for ever showing how these money-lenders are crippling business, but this would serve no practical purpose. There must be a still further scarcity of money, before matters can be brought to a head.

Let us rather discuss a way out of the difficulty, and cease to supply the banker with the wherewithal of his strength.

His chief plea is "Our first duty is to protect the depositor." All such banter is mere talk. Here is a case which shows how the banker protects the depositor.

A certain farmer Jones has \$5,000 in the savings bank department of a bank, and this farmer's neighbor, Brown, wants the loan of \$1,000. The banker smiles one of those love-thy-neighbor-as-thyself kind of smiles, and says: "Well, what security have you?" After finding that the farmer's affairs were in a fairly sound condition, he says: "You just go

to Jones and ask him to back your note for \$1,000 and we'll lend you it at 8 per cent." When farmer Jones goes to the banker he is told that Brown's security is O.K., and that the endorsing is merely a "banking formality," etc. See the point reader? The bank borrows \$5,000 from Jones and lends \$1,000 of it to Brown, after Jones has practically promised by the very act of endorsing the note to repay the bank. If the judgment of Brown's affairs happens to be at fault, they practically take 5 per cent. from Jones, they are not doing one single iota for either Brown or Jones and charge 5 per cent. for doing it.

Now, here's another side to the question, Jones instead of depositing his money with the cash monopolizers, should deposit it in the post office savings bank, and if he wants to lend Brown \$1,000, why, do so and get 8 per cent. (that's what he really is doing yet only getting 3 per cent.) and at the same time his other \$4,000 is doing his country some good. He is financing his nation to the extent of \$4,000 for 3 per cent., and neighbor Brown \$1,000 at 8 per cent. This is what every depositor who pins his faith on his country rather than to a bank is doing.

Another Mode of Investment

NOW, we are sure, there is a chance for the sanitary and heating engineer to get down to business and capture some of this wealth, which makes the banker the "cash monopolizer." The farmer and every other depositor who lives in a rural district is, in 99 cases out of 100, living in a home which is by no means equipped with up-to-date sanitary and heating appliances. They are far more fortunate than the city dweller, because they have pure air, are surrounded by pastures green, and by drilling or digging a well, are sure to get purer water than most cities are getting to-day. They can install a septic tank, and in actual fact live under better conditions than those of the city dwellers. They had far better invest their money in their own property and get all the comforts possible from it than financing the banks with their hard-earned money acquired under conditions which could have been improved by calling in the sanitary and heating engineer. The farmer toils from early morn to dark, and his calling is the foundation of our wealth. If his labors fail him, owing to a bad crop, we all feel

the result. If he is laboring among unsanitary surroundings, he cannot use sound judgment. He is at a disadvantage and it cannot be expected of him that he will be in as high a state of efficiency as if he were laboring under more sanitary and more healthful surroundings. Therefore, we, as sanitary and heating engineers, should have two motives in view when we approach the farmer or rural resident for business. We should realize first our responsibility and then the profits we will derive from such business. Just think how far a thousand dollars will go towards changing a farm or rural home from an unsanitary to a sanitary state, and \$1,000 in the bank will only bring a return of about \$30 a year. Who would object to such an outlay if it could be shown that it only cost, in actual fact, a matter of \$30 per year, plus a small sum for depreciation, and that is just what it amounts to. It would be a good move if a few of the craft would first look over a certain district and find out a few prospects. Then take a little space in the village or popular newspaper, making certain claims and pointing out that the efficiency of the workers can be increased only by adopting sanitary methods in and around our homes and places where we spend a great deal of our time.

The Metal Situation

THE situation in metals has been a very unsettled and unsatisfactory one ever since the outbreak of the present war. Immediately following the outbreak of hostilities, extraordinary advances took place in the price of certain metals, but they only held for a short time and then fell back to their former level or lower. The demand at present is extremely light and the outlook for the immediate future is not any too cheerful. Buyers are still exhibiting extreme caution and are only buying for immediate requirements. Competition for what business is passing is very keen and has resulted in much price-cutting. Many transactions which are taking place are netting the sellers little or no profit. Conditions in the United States metal markets have not improved to any great extent, and those in close touch with the metal trades realize that even a neutral country far removed from the scene of conflict is so closely connected by the bonds of trade and finance with Europe that a disaster there is a disaster in a lesser degree to the American nation. Despite the fact that prospects at the present time are for a temporary continuance of stagnant conditions in the metal markets there is a remarkable feeling of optimism percolating throughout the trade and it is generally believed that before long there will be an improvement in conditions. Collections are showing a slight improvement and the outlook is now considerably brighter than it was a week ago.

Give Thanks

WHAT have we to be thankful for, this year? is a phrase that has been heard on thoughtless lips many times during the past few days. Has not business been restricted by the war; is not the outlook uncertain? The past year has been one of business depression, to which the outbreak of war has come as a devastating climax. All Canadians have suffered. Prosperity, while not obliterated, has been given an undoubted setback. And so the pessimist, wrapped up in his petty trials and disappoint-

ments, may fail to see in the holiday now approaching an occasion for the most heartfelt thanksgiving that human heart has ever addressed to the Deity.

For such is the measure of the meed of praise that Canadians should devoutly offer. What have we to be thankful for? The continued peace of a country free from the slaughter and devastation of war, the continued safety and comfort that we as individuals enjoy, the marvelously full measure of commercial activity that pertains! War sounds in the ears of Canadians, but as a faint echo. The sacking of towns, the bloodshed and rapine that have turned the continent of Europe into a shambles, the suspension of business and the stalking of famine through impoverished lands, the sweep of disease; all the terrors of racial hate, the abysmal results of militarism gone mad, have reached us with little more clearness than a page from the history of medieval days. We do not share in the chaos; we have not even any conception of what it really is.

If the war is protracted long enough for Canadian soldiers to take an active part at the front, the horrors of war will be brought home more closely to us, in the losses which will result. But even this participation would be small indeed compared with the burden of war-racked Belgium or pillaged Poland. Only the presence of an invading force within our borders could bring home to Canada the real meaning of war.

What cause has Canada for thanksgiving? The answer should come swelling from the heart in earnest expressions of praise. The business man, as he looks out over factory, warehouse and store and sees business proceeding without interruption or slackening, must feel grateful for that view, in preference to the view in one's mind eye, which is being laid bare in Europe. As we stated before, we must feel a thrill of thanks pass through our very soul, at the very thought.

Therefore Canadians or any other inhabitant of Canada, let us give thanks, not only upon any specific day, but upon every day, particularly during this most awful war.

Editorial Briefs

CANADA'S wealth is her golden grain.

* * *

THEN operate in fields afar.

* * *

TO LIVE amongst unsanitary environments is to lack efficiency.

* * *

CANADA is the sanitary and heating engineer's field of operation.

* * *

ARE THOSE who till the soil, who grow her grain, living in the most sanitary environments? If not, sanitary engineer, get thee hence. The city is not thy rest.

* * *

THE AGRICULTURIST who lives in sanitary surroundings will grow more wheat, will receive more returns for his labors, and therefore will become a greater earning asset to this Canada of ours.

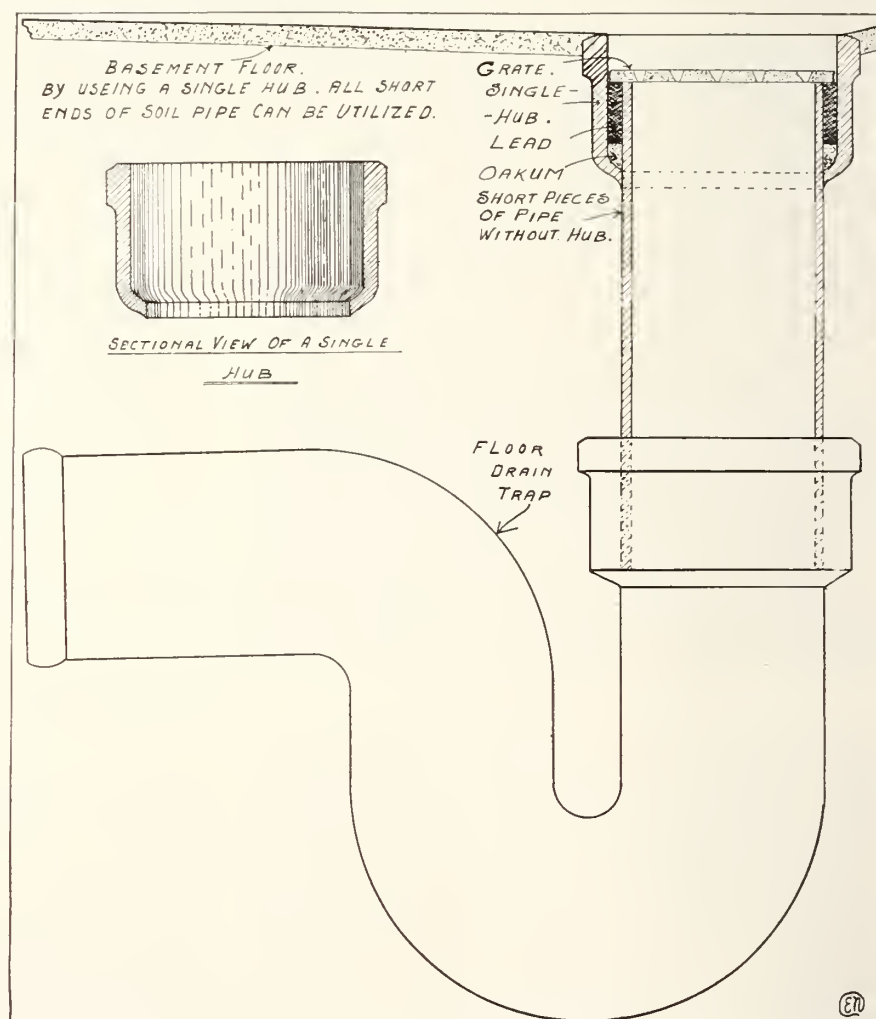
"Shop Economics"—A Talk With Boss, Journeyman and Helper

Showing Where Savings Could be Made, Where the Boss Would Save, Journeyman Earn, and Helper Learn, by Adopting the Right Method at the Right Time.

WHEN in conversation with a manufacturer of soil pipe and soil pipe fittings the other day, he stated that "within the last few months there had been a greater demand for double-hubbed soil pipe than there had ever been before," and remarked that it seemed a shame to see the amount of short ends of soil pipe without hubs that is being sent back as scrap iron. The writer has been of the same opinion for a number of years, and to show how a great deal of these short ends without hubs may be used up, we are showing a sketch of a single hub. This sketch almost speaks for itself. For instance, when a trap is placed in the cellar, and it is some distance from the floor, it is generally necessary to cut either a length of pipe with one hub on, which means that a piece of pipe is going to be wasted, or it is necessary to cut a length of double-hubbed pipe, either of which methods means a waste, because in the first place, by cutting the single-hubbed pipe a piece will be wasted and the time of cutting as well; and when cutting a double-hubbed length there is the time as well as having to use a short length with one hub on, which may or may not always be necessary. Either method has a tendency to fill up the pipe rack with spare pieces, the majority of which find their way to the scrap pile; and it does not take long to measure up 100 feet of short ends on the scrap pile. Such an amount is easily worth \$25. It seems a shame to see the amount of scrap which is brought from a building after a job has been completed, and we are sure if a little more thought were given this end of the business it would repay all the trouble taken. This single hub can be placed on the top of a piece of soil pipe in such a way as to form a stop for the grate, and in every way take the place of a solid hub, and it costs a great deal less. While speaking on this subject of soil pipe, let us mention a few things that happen when making the caulked joint. Just last winter the writer saw one of our journeymen roughing in the vertical stack which had "oakumed" the night before—that is, about eight joints—and the first thing next morning was to be "poured." The metal was made hot—"red hot" at that

—and the pouring began, when "click-click." "What's that?" says the helper. No response was voiced, but the writer thought he'd watch that stack, and a few days after was on hand to see the water test put on. There was temporary heat on the building by then. What was the result? This was a 5-in. stack, and the first two joints poured were a 5 x 4 T.Y. and a 5 x 2 Y. The hubs of each were cracked, and it took nearly a day to replace them, besides all the time wasted in trying to "fake" them up before the inspector got to the job. Another source of trouble occurs when cutting a length of pipe, and in some way or other the piece cracks about an inch up. It can often be made

O.K., if when the hot lead is poured it is not so hot that it causes the pipe to expand. The pipe being cracked a little will not actually expand, but rather will crack a little more. In some cases it contracts and closes up, though this is a big risk. Now the trouble is really in the method of cutting. We still adhere to the old hammer and chisel method. Why not try a regular pipe cutter? The old wheel cutter is the handiest tool on the job. If a little care is taken not to tighten it on the pipe too hard it will work splendidly. Just try it out, readers, and you will find the wrinkle works well. The writer has tried it many a time, and it will be found to save time. Make a straighter cut, and fewer cracks.



Simplified Sanitary Engineering Methods

Showing That to Simplify the Construction of Piping is More to Be Desired Than Multiplicity of Piping—The Latter Does Not Necessarily Increase the Efficiency.

By Dr. Wm. Paul Gerhard, S.E., New York.

IN our last issue we quoted Dr. Gerhard in an article entitled "Simplified Sanitary Engineering Construction." The book from which we quoted is entitled "Sanitary Engineering of Buildings." We intend to continue Dr. Gerhard's work under the above heading until his chapters upon this subject are concluded.

Continuing, Dr. Gerhard says:—

The results of the first mentioned experiments are greatly at variance, and seem to indicate, that while in some cases traps need a strong protection against siphonage, in other cases, especially where the soil and waste pipe have ample ventilation, and branch wastes are very short, such protection is not required. At any rate, it is too early yet to establish rules which apply to all cases. It has always seemed to me as if it would be feasible to practise a wise discrimination.

Where a fixture is located remote from a vertical pipe, and consequently discharges through a long run of waste pipe, which would otherwise form a 'dead end,' it is positively necessary to run a vent pipe from the crown of the trap upward to the outer air, which prevents in the first place a stagnation of air, and at the same time stops siphonage; and this is true of any kind of trap, not only of the class known as S-traps; it should apply to mechanical traps as well.

If, on the other hand, such fixture is located quite near to a vertical thoroughly ventilated soil pipe or a well ventilated horizontal run of pipe, I should not hesitate to place under the fixture a trap which is not easily siphoned, leaving out the air pipe if there is no vent pipe near by to connect with. Such a course seems especially desirable in the case of high buildings for single fixtures in basements or on lower floors. For instance, a 1½-inch sink trap in the basement of a flat, such as is now being erected in New York city, 200 feet in height, would require an air pipe at least three or four inches in diameter to prevent siphonage, the friction in a 1½ or two-inch pipe 200 feet long being too great to allow the air to enter quickly enough to break the suction. I would consider it foolish extravagance to use such long length of pipe of such large size for the trap of only a single sink. If a non-siphoning trap could not be made to answer the

purpose, the only sensible course to pursue would be to abandon such fixture entirely.

I must further say that it seems to me dangerous to the vented S-traps with the usual water seal of only 1½ or two inches under bowls or tubs in spare or guest rooms of large city residences, and for such dwellings generally that are occupied only a part of the year. This danger is generally disregarded or passed over lightly by enthusiasts for 'back air' piping. My personal preference in such cases would always be for a non-siphoning trap with a water seal which does not so easily evaporate, or for a non-siphoning trap with a mechanical seal against gases from the soil pipe, and where rules of local boards of health would demand such an air pipe under such conditions, I should probably advise the use of a tight-shutting stop-valve on the waste pipe, and combine with it an arrangement for the simultaneous shutting off of the hot and cold water supply to the fixture, so as to render an overflow impossible. I am quite ready to admit that the latter arrangement would tend to complicate the plumbing work, but, I think, everybody must concede that, under the conditions mentioned, it would be safer than a vented S-trap with the usual slight seal.

In my work "House Drainage and Sanitary Plumbing," second edition, revised, published in 1884, I expressed a similar opinion, as follows:

It is always costly and often very inconvenient to run vent pipes to the roof. The plumbing work is greatly complicated, and the number of joints which may leak sewer air, greatly increased by trap ventilation. There is also danger that the vent pipes for traps under tubs, sinks and bowls may stop up with soap suds or grease, in which case they would cease to act properly. The continuous current of air in the vent pipe, in passing over the water in the trap, undoubtedly increases its evaporation. Finally it becomes necessary, in the case of high buildings, largely to increase the diameter of vent pipes in order to make up for the loss through friction necessarily occurring with long air pipes. Therefore, while I consider vent pipes for traps a necessary evil in many cases, especially for water closet traps, I am inclined, in other cases, to prefer a good non-siphoning water seal or mechanical

trap, provided the soil and waste pipe system has ample ventilation. Such a mechanical or anti-siphoning trap may be used under sinks, tubs and bowls, but for water closets and slop hoppers (if without a strainer) the simple lead water seal trap with vent attached is the only safe device.*

In an article published in the Chicago Inland Architect, in 1885, and subsequently reprinted in 1887 in my book "Recent Practice in the Sanitary Drainage of Buildings," I stated as follows:

Experiments have established, with a sufficient degree of certainty, the fact that the self-cleansing siphon or running trap, cannot be depended upon always to retain its water seal against siphonage, unless air is admitted at the crown and sewer side of the trap, either by some anti-siphoning trap attachment or by a so-called "back air" pipe of ample size. Consequently, I should not use such traps without providing such protection as the remedies mentioned afford. Later experiments have shown that an air pipe is not a reliable protection against siphonage in all cases, especially where the course of the air pipe is long and tortuous, and that where fixtures are not in constant use, it furthers the evaporation of water in the traps, and hence endangers the safety of plumbing work. That it increases the cost of plumbing and hinders simplicity of arrangement, must be conceded by all. Thus while it offers certain advantages in some instances, there are other cases where the disadvantages predominate. It remains then, to be decided, only after a thorough and intelligent consideration of all conditions, whether a seal-retaining water-seal trap safe against back pressure, siphonage or other influence, or an anti-siphoning trap attachment of some kind, may not be preferable.

In an article on "The Drainage of a House," published in Boston in 1888, and subsequently reprinted in 1890 in the second edition of the book "Recent Practice, etc.," I stated:

From my best knowledge and belief, I cannot accept as universally necessary the requirement of "back ventilation" of traps. . . . I do not fail to explain to my clients that the back airing of traps is done at the expense of sim-

*The many forms of excellent siphon and siphon-jet closets now obtainable are constructed with a very deep and effective trap seal, which does not require a vent pipe where the piping is otherwise properly arranged.

plicity; that in a properly laid out system, trap vent pipes are not necessary to prevent dead ends in short lateral waste pipes; and that prevention of siphonage can be accomplished, and the extra cost incurred by using back air pipes be saved in all but rare instances, by adopting simpler and well-known devices.

Where I am compelled to run back air pipes, complicating the pipe system, it is always my endeavor to modify the arrangement so as not to expose the water in the trap too much to the air current; for there can be no question that the thereby increased free circulation of air in the vicinity of the sealing water of traps hastens the unsealing—by evaporation—of traps under fixtures which remain unused for some days in succession and endangers the security of all traps during any period when a house is left unoccupied.

I am, to-day, more than ever in favor of simplifying the plumbing work of

the safety of the system, seems to me to be worthy of serious consideration.

When using the simple S-trap, I provide, as everybody else does, the "back air pipe" necessary to render this special form of trap safe against siphonage. But I have long ago come to the conclusion that branch pipe ventilation is carried much too far; that instead of giving positive security, it creates new and sometimes serious dangers, and that it also entails an unnecessary and useless expenditure of money. I hold, it is time that this matter be seriously considered by unprejudiced and unbiased experts and sanitarians.

Briefly stated, the objection to the trap vent law are as follows:

(1.) The venting of traps leads to a greater and sometimes dangerous complication of the work.

(2.) It involves a useless outlay of money.

fore increases the danger of leakage at the joints.

(4.) Traps vents attached to the horns of porcelain fixtures, such as water closets, often lead, in case of settlement of the building, or through expansion, to the breakage of these horns, thus opening up a dangerous inlet for sewer air, the crack often remaining unnoticed for years.

(5.) The mouth of the vent pipe at the point where it attaches to the crown of the trap, is liable to clog up with congealed greasy deposits, rendering the vent pipe useless without this fact becoming apparent to the occupant of the house.

(6.) The upper end of the back air pipe where it extends separately to the roof, is liable, unless enlarged to at least four inches in diameter, to be closed up with snow or hoar frost in winter time.

(7.) Owing to the increased air current passing over the water seal of the trap, and induced by the vent pipe, the destruction of the water seal by evaporation is much more rapid.

(8.) The trap-venting system affords increased opportunities for bye-passes in the case of careless or ignorant workmen. In my examinations of the plumbing of houses I have discovered bye-passes even where such work was done under board of health inspection.

(9.) In the case of long vent pipes, particularly where there are several sharp bends in the pipe, the friction of the air passing through the pipe, is sometimes increased to such an extent that the vent pipe fails to protect the trap from siphonage.

"But," say the advocates of trap vent pipes, "these pipes are not only put in to prevent siphonage. They are intended equally to aerate the branch waste pipes and to produce a circulation of air in the entire system of branches." To this I reply, that plumbing work can and should be always skilfully arranged and planned, so that the fixtures are located immediately adjoining well-ventilated soil or waste pipe lines, and if thus arranged, the short branches are so well flushed by the frequent discharge from the improved modern fixtures with large outlets—each of which constitutes in itself a small flush tank, and only such should be considered at all—as hardly to require any other purification or aeration. Just the moment, however, the branch wastes become long, owing to the location of the fixtures, I always insist upon the proper ventilation of the branches by continuing the lateral wastes the full size into a vertical line which is carried up to the roof the same as the soil pipe.

To illustrate the simplified method further, I submit herewith several illustrations, showing the proper arrangement

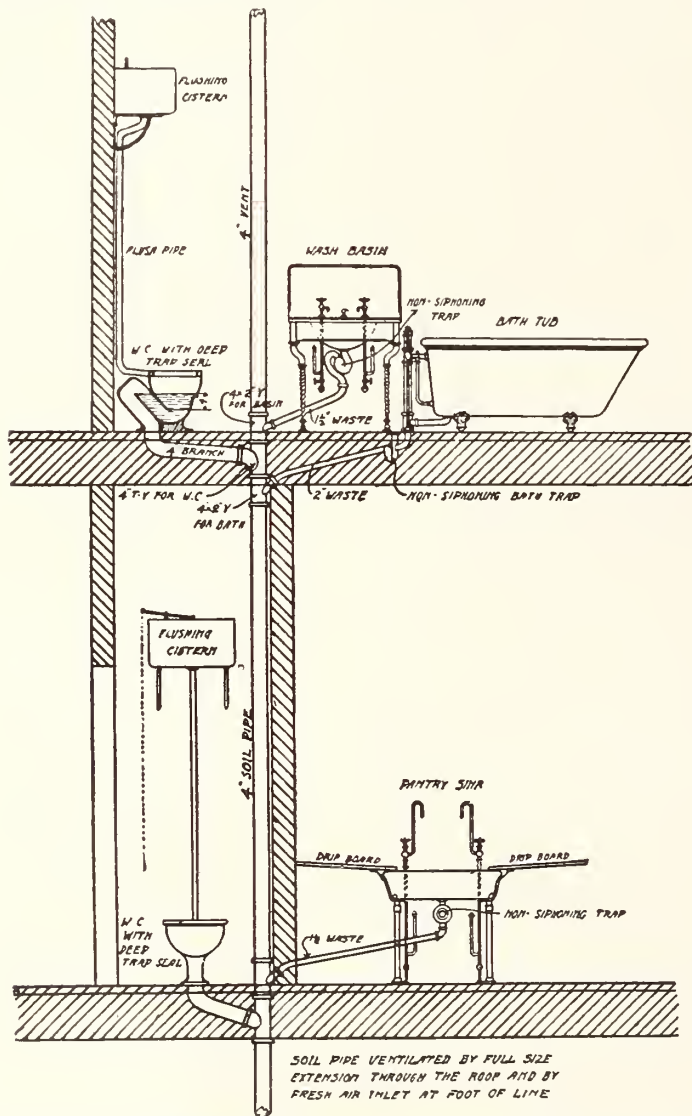


Fig. 90.—Section through bathroom on second floor, and through butler's pantry and toilet room on first floor, showing simplified plumbing.

buildings. Anything that helps to reduce the present complicated system of piping, while at the same time retaining

(3.) It increases, and often doubles, the number of pipe joints in a building, it duplicates the pipe system and there-

of plumbing work and of the piping without the use of "back air" pipes attached to the traps. The traps used in the system are either non-siphoning water-sealed traps (not mechanical traps), or anti-siphon vent attachments to the S-traps, or else, in the case of water closets, common S-traps with such a depth of seal that the ordinary siphonage, induced by the discharge of other fixtures (not that induced by applying a suction pump to the plumbing and creating a vacuum in the pipes, which is a condition never happening in a well-arranged plumbing system) does not destroy the trap seal.

In Fig. 90 I illustrate the simple case of several fixtures on two floors directly over each other, located close to a well aerated soil pipe line. Instead of an intricate plumbing system with a hopelessly confusing number of pipes, we obtain a simple but safe system of plumbing, one which, to my mind, is vastly in advance of the ordinary method now in vogue. Whoever would call such a system a defective one or consider it not in accordance with sanitary requirements, is either a narrow-minded ignoramus or else he wilfully misrepresents true and undeniable facts.

In Fig. 91 I show the somewhat more elaborate case of a group of lavatories on several floors of a building. The pipe line A is the vertical waste pipe, having on each floor a two-inch Y-branch to receive the branch wastes from the wash basins. These branch wastes D are two inches in diameter (or larger than each basin waste), and receive by means of two inch by $1\frac{1}{2}$ -inch Y-fittings the short branches from each basin. Each basin waste is trapped by a $1\frac{1}{2}$ -inch non-siphoning trap as shown. The branch waste does not form a dead end at its upper part, but is continued, by pipe C, two-inches in diameter, to a vertical straight vent line B, aerating the branch waste lines.

With such an arrangement, siphonage is impossible. If basin No. 1 is discharged, the flow of water induces an air current through pipe D, which is supplied through pipe B, and the traps of basins Nos. 2, 3 and 4 cannot be at all affected. If basin No. 4 discharges, the flow of water passes the Y branches for basins Nos. 1, 2 and 3, and an air current from pipe B follows. Again, should several basins on the upper floor be discharged through pipe line A, an air current is induced from the upper extension of pipe A, also from pipe D and B, and when the column of water passes the two-inch Y branches on the floor below, air also follows from pipe D and B.

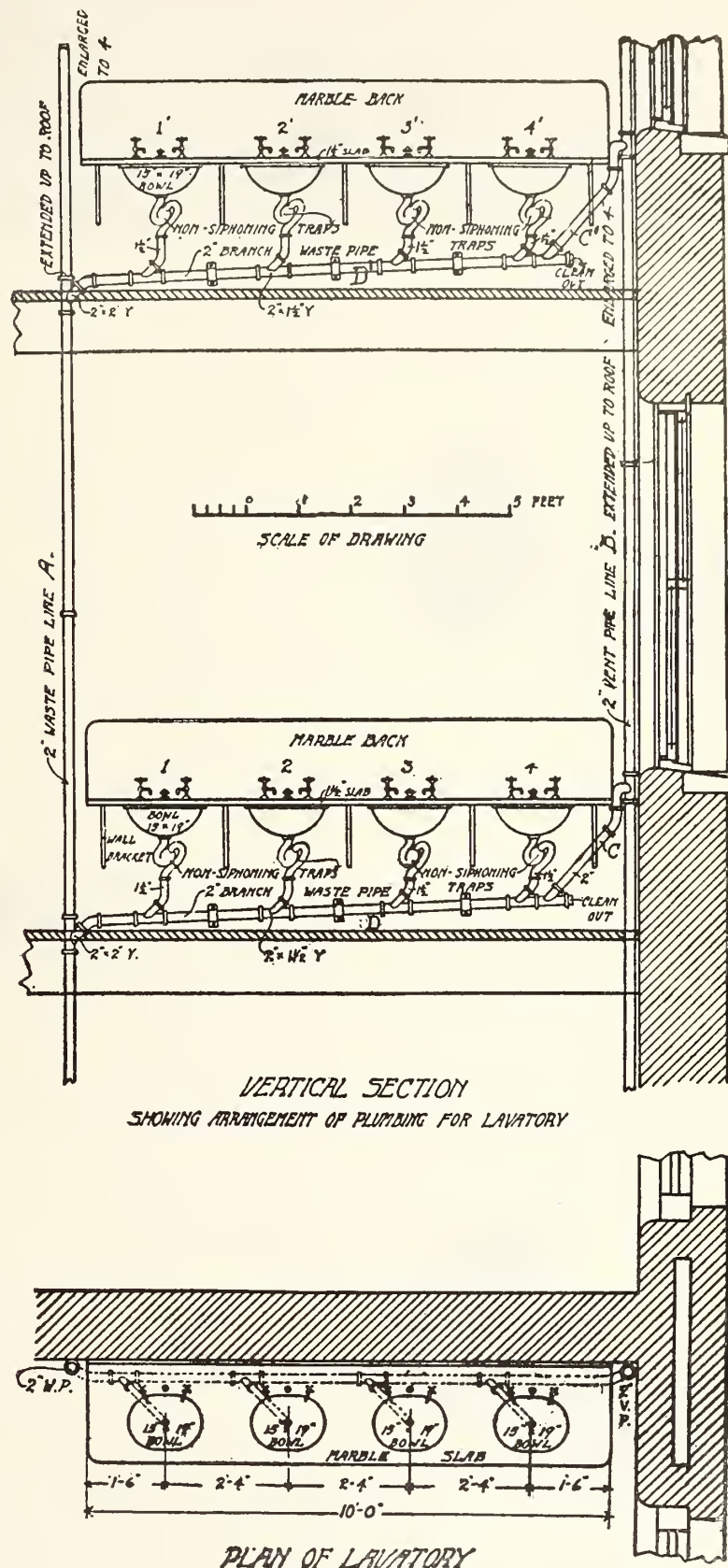


Fig. 91.—Plan and section showing simplified plumbing for a group of lavatories.



New Booklet on Rams.

A very interesting and valuable book on hydraulic rams, is being issued by The Rife Hydraulic Engine Mfg. Co., Trinity Buildings, 111 Broadway, New



I wish de boss ud put a laundry tub in. I've an awfu backache.

York. Sanitary engineers are often being asked for information about these appliances, and by writing to above address may procure a copy free.

Must Submit Plans First.

At a meeting of the Board of Health, Fredericton, N.B., recently, it was decided that all sanitary engineers must file their plans of any plumbing work, previous to starting such work. These plans will be inspected by the Secretary of Public Works and the plumbing inspector, after which a permit will be issued for the work.

Commenting upon the above, we must



Wow, dis wouldn't have happen if de boss had put a laundry tub in.

say we congratulate the Fredericton Board of Health upon the move. It is one in the right direction. Such a plan if rigidly carried out, will result in sanitary engineers devoting more time to drawing their own plans, and in that way will decrease the number of men

who are not practical, and who do not understand the trade as they should. If this method will only become universal, it will solve a lot of the price cutting. It will show a man exactly what fittings and material he will require on a job, and in all make him know more of the business he is engaged in, and we have never met the man who knew so much, but what he would derive some benefit by knowing a little more.

New Pocket Hand Book.

A very useful hand book is being published, entitled "Scales," for ascertaining the dimensions of pipes, drains and sewers, by C. E. Housden, late superintendent engineer, Public Works Dept., India, and Sanitary Engineer to the Governments of Burma, Eastern Bengal and Assam. This book contains illustrated pages showing charts and draw-



No. 1027.—Hack Saw Frame.

ings of the various types of drains, and the methods for finding of capacity of same. All sanitary engineers interested in the laying out of drainage systems should procure one of these books.

Pistol Grip Hack-Saw Frame.

The Millers Falls Co., Millers Falls, Mass., offer the trade a new pistol grip hack-saw frame. The new frame, No. 1027, is equipped with a handle made from black composition containing some rubber, is handsomely knurled, and attached to the back of the frame by a steel rib extending practically the full length of the handle. The latter is moulded on to the rib all in one piece, and thereby gains in strength.

The "hang" of the frame is one of its particular features, the weight being nicely distributed.

The tension of the blade is by means of a thumb nut and screw stud purposely placed on the handle end of the blade so as to allow maximum stroke of the blade in places where stroke is limited by some obstacle.

The frame is adjustable for blades from 8 to 12 inches in length, is polished and handsomely nicked, and measures $3\frac{1}{4}$ inches from point of teeth of



I may as well wash ma cloes while I'm in de tub.

blade to underside of back. The stock is stiff steel strengthened by a sheath on the back. Each frame is supplied with a 10-inch Star hack-saw blade.

There is claimed for the grip the greatest adaptability and comfort to hands of varying sizes. The handle being open and not united to the frame at its lowest point, allows the little finger of the operator to drop below the handle, if desired.



ENGINEERING BY-LAWS.

(Continued from page 17.)

down the penalty for breaking any of the various clauses in this by-law.

In conclusion, it must be stated that



Say! Turn over the page while I get out of de tub.

as a whole the plumbing by-law of Fort William, while it would bear some revision here and there, is far more up-to-date than that of many a larger Canadian city, and if enforced by a practical man, and revised too in the near future, the citizens of Fort William need have very little to fear.—Editor.

Domestic Hot Water Supply Problems

A Series of Articles Dealing With the Problem of Hot Water Supplies, Range Boiler Connections, in Several Forms and Methods Adopted as a Means of Heating Water Under Various Conditions.

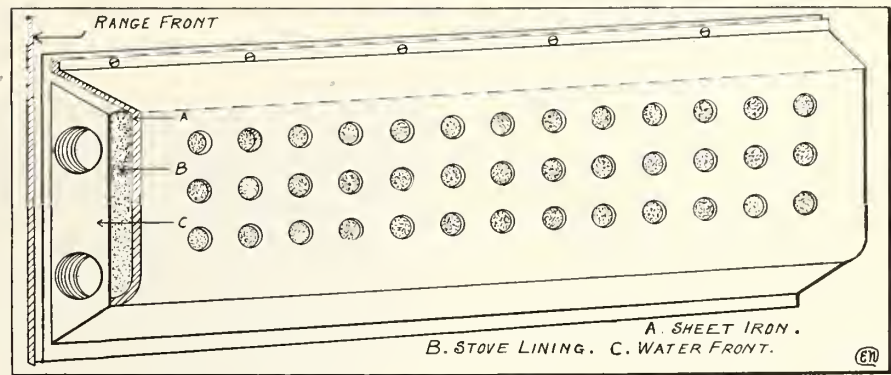
ONE great source of trouble with water fronts and coils fitted into ranges is often met with in cases where the water supply is from lakes or open reservoirs, the water from which is highly impregnated with lime or other chemical impurities of a mineral nature. In some cases the chemical action which takes place is the cause of the range connections becoming corroded, but such corrosion is often of a slow nature, except where a thread has been poorly fitted, and a slight leak is found. Under such circumstances it does not take very long to eat away the metal, and finally destroy the piece of pipe at the leaking joint.

Another source of trouble as well as danger has been found where pipes become coated on the inside with such chemical matter as carbonates of lime and sulphates. These adhere to the inner walls of the pipe, and in many cases almost choke them up. The deposit nearest the heat becomes very hard and the core or centre of the deposit is not so hard. This condition is very objectionable, as well as dangerous, not only to water fronts, but also to gas water heaters. However, the trouble can be overcome. First, it must be thoroughly understood that if the water is not heated to a higher temperature than 110 degrees such deposits will be very slight. Therefore, if a low temperature is necessary to prevent the choking up of pipes such choking must be prevented by resorting to some method such as connecting a

is very essential, because if the circulation is in any way sluggish, the water will be retained in the water front for too long a period, which is bound to result in the temperature of the water being raised too high.

The question of a choice in gas heaters cannot be too strongly emphasized.

proves that quick circulation is very necessary, and almost any means would be justifiable to encourage a quick circulation. For instance, where possible 1-inch pipe should be used. Metal to metal unions should also be placed in all such piping, because these can be relied upon to give full bore through them. All



When it is known that the water is highly charged with sulphates and carbonates of lime, a heater should be chosen which can be relied upon to supply a large quantity of warm water rather than a small quantity of hot water in extra quick time. It would surprise some of our readers to see what happens to some of the highly efficient gas water heaters which deliver very hot water in a short time.

In such cases a thoroughly reliable thermostatic controlling valve is required, one which will close off the gas

pipes should be free from burrs, and, if at all possible, long sweep elbows should be used.



THE BEERS LANTERN.

The Beers Sales Co., Bridgeport, Conn. are offering the trade the Beers electric hand lantern here illustrated.

The lantern is strongly made of seamless brass highly polished also of pressed steel with black rubber finish.

It is durable and compact with no projecting parts to be easily damaged. The handles are constructed to fold down on the sides of the lantern so that it can be easily slipped in the pocket.

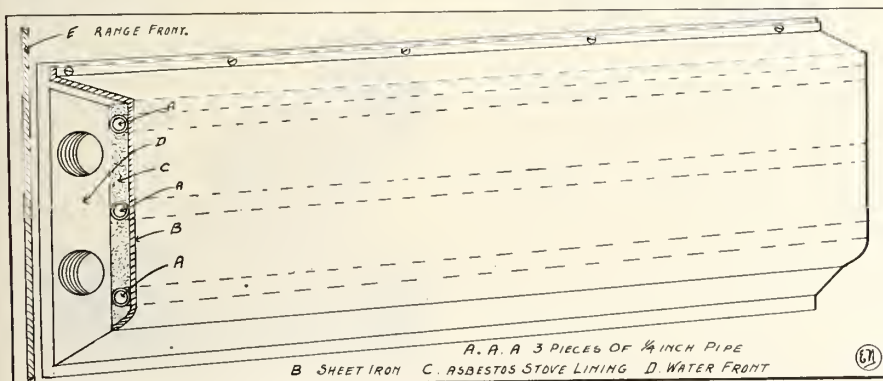
One of the advantages claimed for the lantern is that it uses an ordinary dry cell battery which can be purchased anywhere at a moderate rate.

The battery is easily inserted by unscrewing the end cap.

The Mazda bulb which is supplied with the lantern is especially designed to consume a very small amount of current. It gives a strong, clear, white light, which is magnified many times by the silver plated reflector and imported, ground, optical lens.

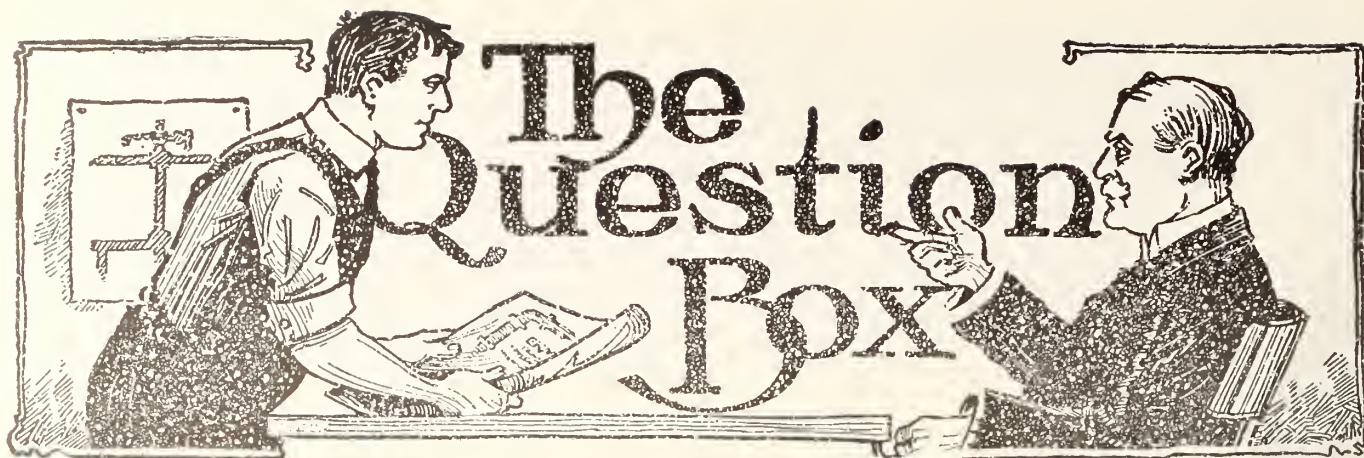
The contact switch is of special design, being a combination, which gives either intermittent or permanent light as desired. It is conveniently placed so

(Continued on page 26.)



very large boiler to a smaller water front, or partially insulating the water front. This can be done in many ways, which we are showing in Fig. 1. It must be borne in mind that quick circulation

when the heat of the water reaches 110 degrees Fahr., and even then if the water is raised to a higher temperature at the point where the gas flame strikes the coil, the coil will soon choke up. This



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

TO PREVENT BOILER SCALE.

Slabs of zinc have often been used in boilers and hot water tanks to prevent scale formation. The action appears to be an electrical one, the iron of the boiler structure being one pole of the battery and the zinc slab the other. Under the action of the current of electricity so produced, the water is slowly decomposed into its elements, oxygen and hydrogen. The hydrogen is deposited upon the shell, where it remains uncombined. It will not unite with the iron to form a new compound; but if any iron rust be present it will remove the oxygen from this, and leave the metallic component of the oxide deposited upon the plate. The oxygen of the water that is decomposed goes to the zinc and forms oxide of zinc, and in the course of time the zinc will be found to be almost entirely converted into oxide. On account of the action here described, it is generally believed that zinc is a good thing to prevent both scale and corrosion, and that it cannot be harmful to the boiler under any circumstances. But such is not always the case, and reports of trouble leading from the use of zinc have not been infrequent.

W.C. Venting and its Relationship to the Breather.

Editor Sanitary Engineer.—In various articles you have taken the stand that main house traps are not necessary, at the same time you have stated that where the law called for such a trap, there should be a breather attached.

In an article re the venting of w.c. at the lead bend, when in battery, you showed a circuit vent as being a suggestion from one of your readers. What is your opinion about this circuit vent? And where a main house trap is demand-

ed, why would it not be just as well to do away with the circuit vent. Let the breather act as a relief against any back pressure, which would arise when any of the w.c.'s were flushed.

A. C. R.

A. C. R. has certainly sent in a very interesting inquiry, and one upon which a great deal can be said. We certainly do take the stand that the main house trap should be discontinued, and will be before very long. In answer to the first question as to whether we would consider a circuit vent good practice, we may say we would endorse the use of a circuit vent in preference to back venting every w.c. at the lead bend, which is so common a practice, and if there is a trap used on the main drain, it would not be necessary to use the breather. Our correspondent asked, "Why would it not be just as well to do away with the circuit vent and let the breather act as a relief, etc. To that question we believe that there should never be any open outlet from a house or other building drain, from which the odor is liable to be forced out when any fixture is flushed in the building and again let us state that 90 per cent. of the breathers are blocked up after being installed a few years.

Just imagine a breather which is connected to a battery of say 10 to 20 or more w.c.s being allowed to act as a relief pipe to prevent a back pressure, under any condition we do not advocate using a breather as a relief, in place of a circuit vent.

More Than Chief Plumbing Inspector.

Captain W. H. Meadows is evidently more than the chief plumbing inspector for Toronto. He is also "some" military man. About 70 members of the

Public Health Department are under his care somewhat, and amongst them is the worthy M. O. H. Dr. Hastings, who is Honorary Captain of what is now known as the Public Health Rifle Association. This association met for the first time at the armories, and took instructions in sighting from Captain W. F. Meadows. They will meet every Tuesday evening until further notice.

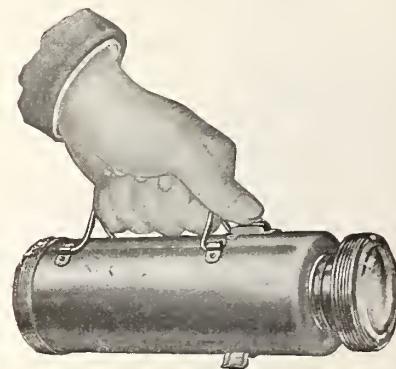


THE BEERS LANTERN.

(Continued from page 25.)

as to be directly under the thumb, when the lantern is being carried, ready for instant use. Pressing a button gives light as long as it is pressed. Sliding a button $\frac{1}{4}$ of an inch gives constant light without further pressure until the button is pushed back.

The makers claim that automobilists will find that batteries too weak for igni-



The Beer's Lantern.

tion purposes will give further long service in the Beers' Lantern.

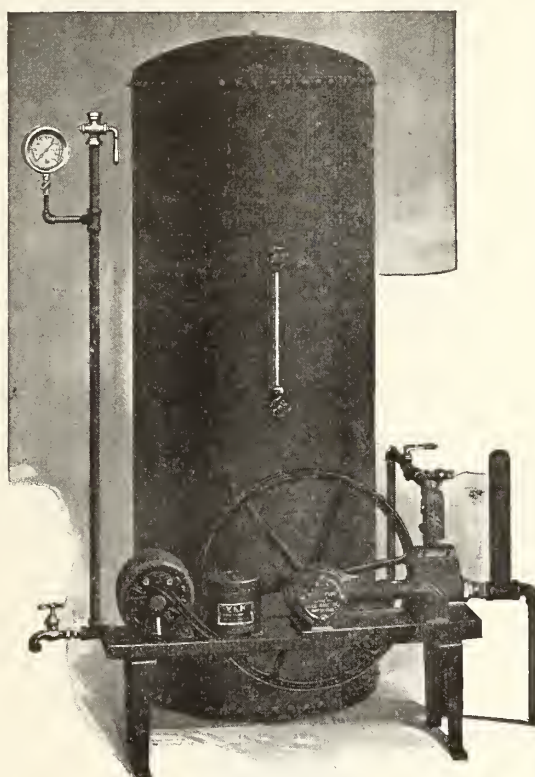
The lantern is 9 inches in length and $2\frac{7}{8}$ inches diameter. The makers claim it will burn an hour a day for fifty days.

Have You Ever Looked to Your Surrounding Country Districts for Business?

Owing to the unfortunate war conditions in Europe the farmer is the most prosperous man in Canada to-day. He is getting more for his crops than he has for some previous years, and it is not only in your interest, but your duty, to see that this extra money going to him is kept in circulation.

Make him a visit to-day and show him the necessity of installing a complete water supply and sanitary system.

System No. B4, including tank, pressure gauge, water gauge, pump, electric motor and automatic switch, relief valve, $\frac{1}{2}$ -inch stop, $\frac{3}{4}$ -inch stop and waste, and $\frac{1}{2}$ -inch compression bibb tank, 30" x 6 feet



System No. B4

capacity — 220 gallons, vertical lift of pump 18 feet—will discharge to height of 75 feet and supply five ordinary house fixtures; pump automatically starts and stops by electric switch.

We have a large variety of outfits for every kind of domestic service, including hand, electric, water and power driven, deep and shallow well pumps. Write us for information and prices. We are sure that there is a large field for business open to you if you only go after it, and we wish to help and co-operate with you in every way possible.

Empire Manufacturing Co., Limited

LONDON, CANADA

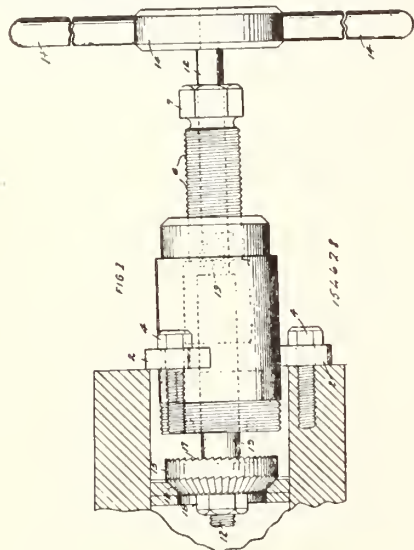
MANUFACTURERS OF AND DEALERS IN
PLUMBERS' AND STEAMFITTERS' SUPPLIES OF ALL KINDS

NEW CANADIAN PATENTS

No. 154,628.

John Hagbert Frederickson, Keewatin, Kenora, Ontario, Canada, 24th March, 1914; 6 years. Filed 20th February, 1913. Receipt No. 220,827.

Claim.—1. In a valve seat grinding device, a bonnet at one end with an adjustable jacket, centering means associ-



Valve Seating Machine

ated with the opposite end of said bonnet, a shaft formed with an intermediate enlarged portion extending through and beyond said jacket, bonnet and centering means, a handle at one end of said shaft, a grinder upon the opposite end of said shaft, and means carried by said bonnet for retaining the same in position upon an engine cylinder.

2. In a valve seat grinding device, a bonnet provided at one end with an adjustable jacket, centering means associated with the opposite end of said bonnet, a shaft formed with an intermediate enlarged portion extending through and beyond said jacket, bonnet and centering means, a handle at one end of said shaft, a reversible grinder provided with angular and with straight teeth removably secured to the opposite end of said shaft, and means carried by said bonnet for retaining the same in position upon an engine cylinder.

3. In a valve grinding device, a bonnet provided at one end with an adjustable jacket, a key nut carried by the opposite end with an adjustable jacket, a key for said key nut, a shaft formed with an intermediate enlarged portion extending through and beyond said jacket, bonnet and key nut, a handle at one end of said shaft, a grinder upon

the opposite end of said shaft, and means carried by said bonnet for retaining the same in position upon an engine cylinder.

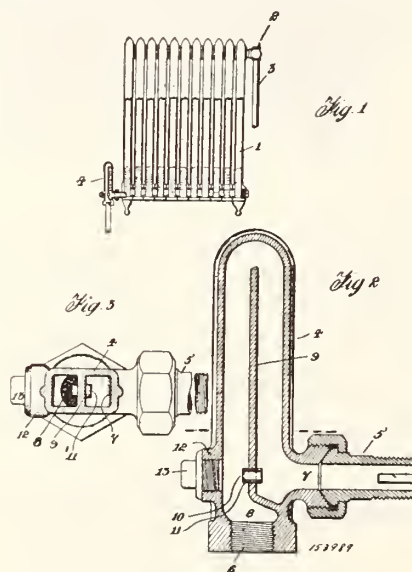
4. In a valve seat grinding device, a bonnet provided at one end with an adjustable jacket, a key nut carried by the opposite end of said bonnet, a key for said key nut, a shaft formed with an intermediate enlarged portion extending through and beyond said jacket, bonnet and key nut, a handle at one end of said shaft, a grinder upon the opposite end of said shaft, a spring disposed upon said shaft abutting the enlarged portion thereof, and said adjustable jacket and means carried by said bonnet for retaining the same in position upon an engine cylinder.

...

No. 153,989.

Eugene Solomon Manny, Montreal, Quebec, Canada, 24th February, 1914; 6 years. Filed 29th December, 1913. Receipt No. 232,855.

Claim.—1. A radiator return trap designed to maintain a head of water in the face of the radiator under heating conditions and to permit the emptying of the radiator under non-heating conditions, said trap comprising a vertical casing with an inlet at one side towards the bottom suitably connected to the radiator, and an outlet at the bottom, said inlet and outlet being separated by a vertical wall forming a seat, and having a small outlet therethrough at the bottom.



No. 153,989. Radiator Trap.

2. A radiator return trap designed to maintain a head of water in the base of the radiator under heating conditions

and to permit the emptying of the radiator under non-heating conditions, said trap comprising a vertical casing having an outlet in its bottom and an inlet at one side towards the bottom suitably connected to the radiator, a vertical wall separating said inlet and outlet and extending nearly to the top of said casing, a thimble having a very small outlet orifice therethrough and secured in

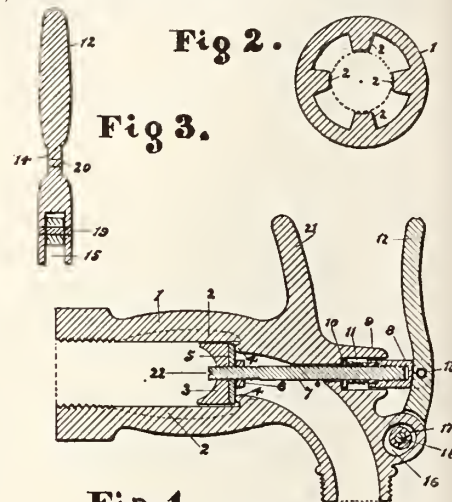


Fig 1.

No. 153,864. Tap.

said wall opposite said inlet opening, and a removable plug secured in the threaded orifice in the side of the said casing opposite said inlet for the purpose herein described and set forth.

3. A radiator return trap designed to maintain a head of water in the base of the radiator under heating conditions and to permit the emptying of the radiator under non-heating conditions, said trap comprising a vertical casing having an outlet in its bottom and an inlet at one side towards the bottom suitably connected to the radiator, an open-ended tube secured in said outlet and extending nearly to the top of said casing forming a vertical sealing wall separating the inlet and outlet, said tube having a small outlet orifice in its wall near the lower end.

NEW SCREW PLATE ASSORTMENT.

Butterfield & Co., Inc., Derby Line, Vt., manufacturers of screw plates, are placing on the market the Combined Automobile Screw Plate. These screw plates contain taps and dies, cutting the S. A. E. standard, and also the regular "V" thread, or the U. S. standard, as may be wanted, all complete with stocks for holding the dies, and high grade tap wrench, in hardwood case.

Practical Problems for Sheet Metal Workers

IN this article we show how to develop the cone and branch of a local vent.

The method adopted is very similar to that used when developing the pattern of a branch which requires to fit a cylindrical pipe at an angle. It is such practice which gives the tinsmith or sheet metal worker actual knowledge along other lines of pattern development. Fig. 1 shows a perspective of the article to be developed. Fig. 2 shows a cone of a slightly different shape, but one which the same pattern of branch will fit, for the simple reason that the slopes are the same, except that the position of the branch is reversed, Fig. 1 being a vertical branch, while Fig. 2 has a horizontal branch; both are used for local vents, but fit various conditions.

First of all, the plan and elevation should be drawn on thick paper and measurements decided upon. These may then be transferred to the metal pattern. Draw plan and divide lower half as shown by 1, 2, 3, 4, 5, 6, 7, 8, 9. Next erect center line upward, said line being center of cone in elevation. Next describe elevations as follows: C, D, E, F, G, H, I, the points C, D, E being the outline of cone and F, G, H, I the branch. Next erect dotted lines upward

from G, F and determine the center; then from center L make circle, which is plan of branch. Divide upper half of this circle with four equal parts, as shown in a, b, c, d, e. Next draw dotted line downward from a, c e to a dotted line J, K on plan, and b, d downward as far as slant line I, H on side of cone. Next draw six horizontal dotted lines as follows:—First or top line in line with G, F; second, from I, which must extend across cone and all the other dotted lines as shown until H has been reached. Next step will be to erect vertical dotted lines from points on side of cone which the vertical lines intersect. These lines are required to determine the inner circles shown in plan. Next draw the inner circles. Having done so, describe another smaller circle, making M center, which is center of branch; then mark points where larger inner circle intersects small circle as shown 5, 4, 3, 2, 1. These figures determine the stretch-out measurements required for pattern of branch, therefore the next step will be to transfer these measurements twice to the horizontal line which is extended from top line G, F as shown 5, 4, 3, 2, 1, 2, 3, 4, 5.

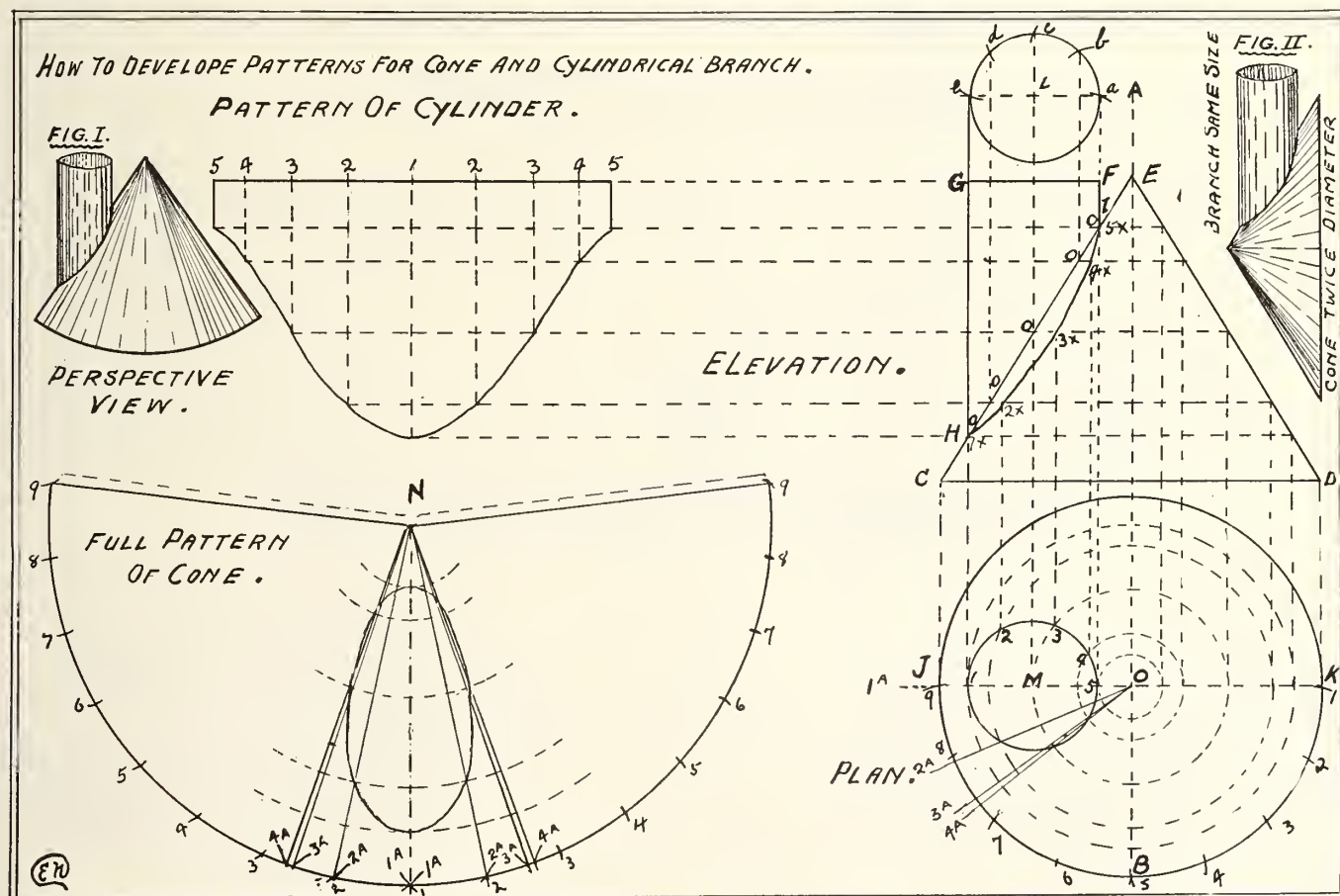
The next step to take will be to erect

lines from the points last numbered, on a downward course until all the horizontal lines are intersected. Then by connecting the same from points where intersections take place, the pattern for branch is complete.

If it is desirable to show points of intersection where branch connects the cone, erect vertical lines from plan which has M as its center, from points marked 1, 2, 3, 4, 5 to horizontal dotted lines as shown by points marked 1x, 2x, 3x, 4x, 5x, and connect these intersections as shown by solid line.

We will now turn to the developing of pattern for cone and hole for branch. First place the point of compass at E on elevation and open up to C; then erect vertical line as shown in full pattern of cone, making N the center. Next draw an arc as shown, then transfer the stretch-out measurements shown on plan of cone starting at center line N of arc, with 1, 2, 3, 4, 5, 6, 7, 8, 9 on both sides. This will give the proper pattern of cone; the dotted lines shown on the upper portion of pattern are allowed for lapping the seams over.

We will next describe the pattern for hole necessary for branch. Place the straight edge at center point O on plan



of cone and draw straight lines from center O so said lines will cross points where circles intersect, until outer circle is intersected as shown at 1a, 2a, 3a, 4a. Transfer these measurements to the pattern of cone, beginning with 1a at vertical line where N intersects the arc and following on until all the measurements have been transferred as shown. Now place the straight edge at N and draw lines from N to points 1a, 2a and on as shown.

The next step will be to determine the

proper points of intersections as described in the arcs. This is done by placing point of compass at E in elevation and opening up to the various intersections marked O on slant line E, C, which will determine the proper points of intersection which is necessary to develop the pattern of hole. Having now transferred the various O measurements, trace a solid line as shown from points where are intersects the lines drawn from N to 1a and 2a, etc.

This completes the two patterns.

ence with reducing valves, should write to the James Morrison Brass Manufacturing Co. for further particulars. A very interesting folder has been prepared which thoroughly explains all the novel points in the construction of this pressure reducing valve.



STEEL TANK COIL FIRE POT.

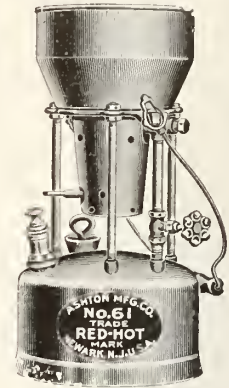
The Ashton Mfg. Co., Newark, N.J., makers of the Red-Hot line of torches and fire pots, are offering the trade their

New Sanitary and Heating Goods

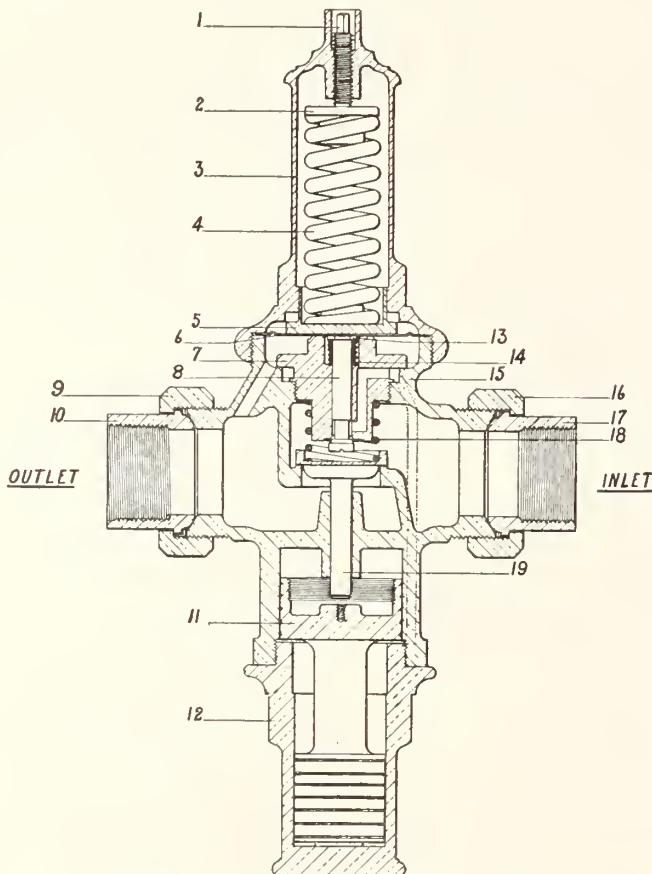
NEW REDUCING VALVE.

In the majority of steam power plants and in the industrial use of steam there develops a need for steam at different pressures. The boilers are installed to generate steam at the highest pressure used, and some device or valve must be employed which will reduce the high pressure steam to the low pressures required for such apparatus as is used in heating, dyeing, boiling and drying, etc. There are many devices on the market for this purpose, generally called reducing valves, and needless to say the great diversity of design results from an

almost universal failure of such valves in general to render fully satisfactory service. Usually the initial or high pressure is subject to more or less variation through quite wide ranges, and, as frequently occurs, the low pressure side is also liable to variation at the same time. For this reason it has been found very difficult to construct a reducing valve that would operate perfectly under all the varying conditions to which a valve of this type is subjected. To the heating engineer particularly a reliable reducing valve is nothing short of a boon. These who have had any experi-



New Model of Fire Pot.



J.M.T. New Pressure Reducing Valve.

new Steel Tank Coil Fire Pot. The tank is made of heavy seamless drawn steel, coppered inside and out, with bottom and all fittings welded in (not soldered), which, the makers claim, makes it practically indestructible.

The coil and burner are made of the best steel and the valves are supplied with packing nuts, which prevents leakage. An extra large funnel and filler plug prevents waste of fuel in filling.

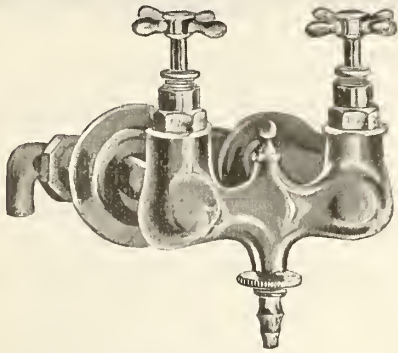
The upright rods and top plate are made extra heavy and the shield is drawn from one-piece seamless steel. A brass automatic pump with double spring valve supplies the needed air pressure quickly.

This fire pot is also made with rubber bulb instead of pump for those who prefer same, and the makers guarantee them to give perfect satisfaction inside or out doors, in severe winter weather.

Catalogue will be mailed upon request.



The firm of Shearing & Flander, of Tillsonburg, who have conducted a successful tinsmithing and plumbing business here for some years past, have mutually dissolved partnership. The business will be conducted in future by Mr. W. J. Shearing, Mr. J. D. Flander having purchased an excellent business in the town of Ingersoll. Mr. Flander and his family have been highly respected citizens of our town, and will be greatly missed here.



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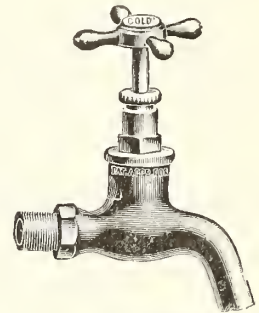
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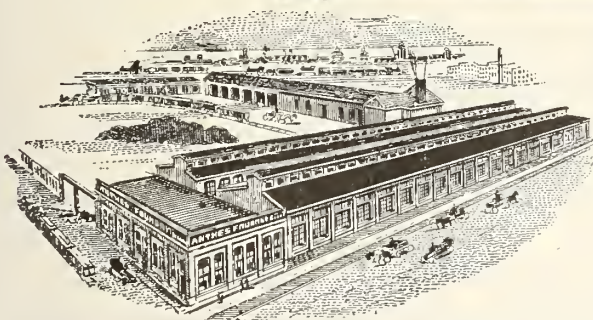
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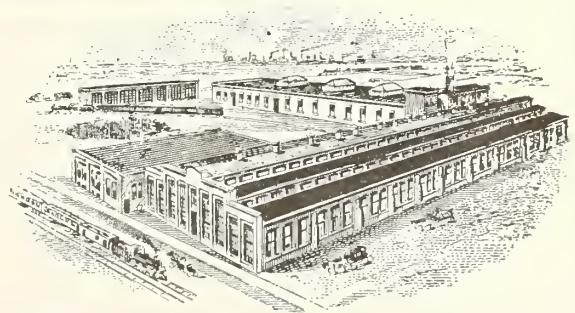
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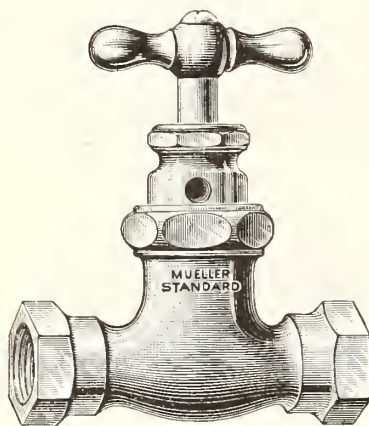
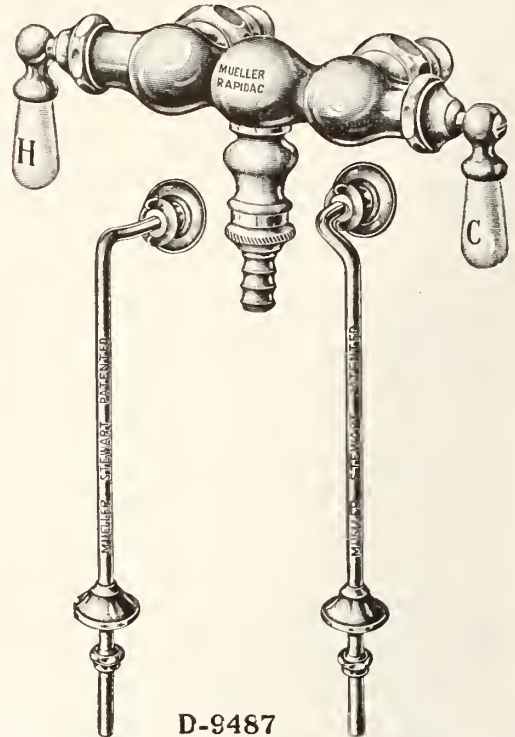
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Saves time because it leaves no burrs to ream out or file off.

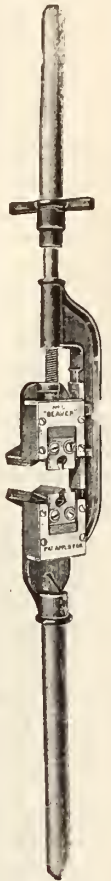
Simply close it on the pipe and pull two handles, same as a die stock—the feed is automatic.

The form of the knives regulate the depth of the cut.

The largest users of pipe have discarded their wheel cutters in favor of the "Beaver" because it **works easier and quicker** and makes a square pipe end on which threading dies start easier, last longer and run straight.

A trial will convince you of its merits.

The Borden-Canadian Co.
Toronto, Canada



G.M.C. WATER SYSTEMS

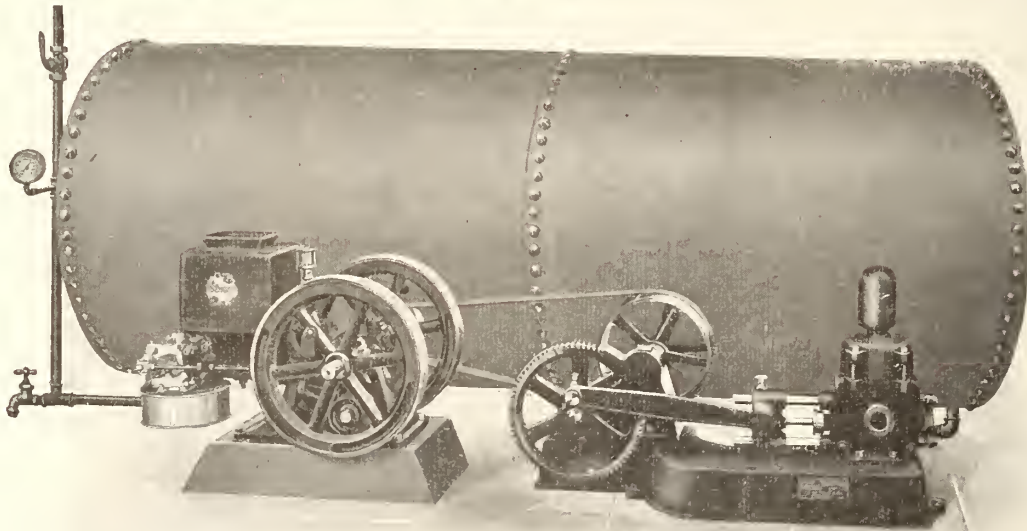


Fig. 63

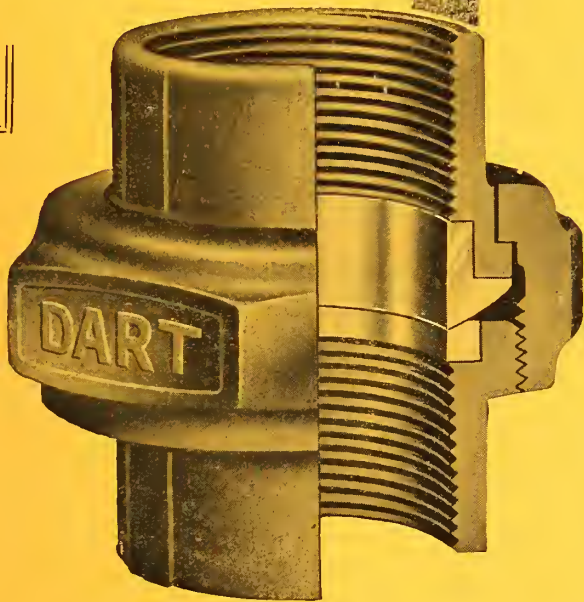
Why not interest your Farmer Friends in a System and supply their Sanitary and Plumbing arrangements also?

Our "30" outfits as illustrated, or with direct-connected motor or gasoline engine, are specially adapted for the Farm Trade.

THE GENERAL MACHINERY CO., LTD., 22 Mulock Ave., TORONTO

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

DART Unions



—last indefinitely because there is no deterioration at the joint and the heavy iron parts are proof against expansion, contraction and vibration.

These union pipe couplings are easily and quickly installed whether pipes are in or out of line, and they stay tight until deliberately loosened with a wrench.

Get them from your jobber.

If a Dart Union isn't right you'll promptly get two new ones.

Dart Union Co., Ltd., Toronto

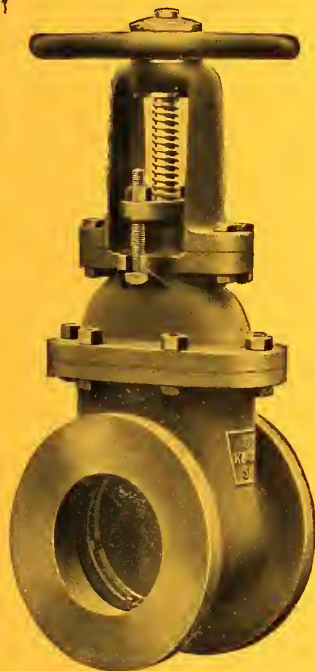
BRONZE TO BRONZE AT THE JOINT

KERR GATE VALVES

OUTSIDE SCREW AND YOKE

"KEYSTONE" PATTERN

Embody all the latest features



4½-in. and larger

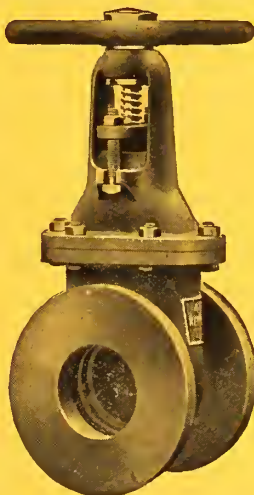
Screwed-in Seats

Deep Bronze
Bushed Gland
and Stuffing
Boxes.

Full Opening.

Large Diameter
Hand-Wheels.

Solid Wedge
Discs.



4-in. and smaller

Narrow face-to-
face Dimensions

Symmetrical
Design.

Good Material.

Interchangeable
Parts.

Guaranteed
Tested.



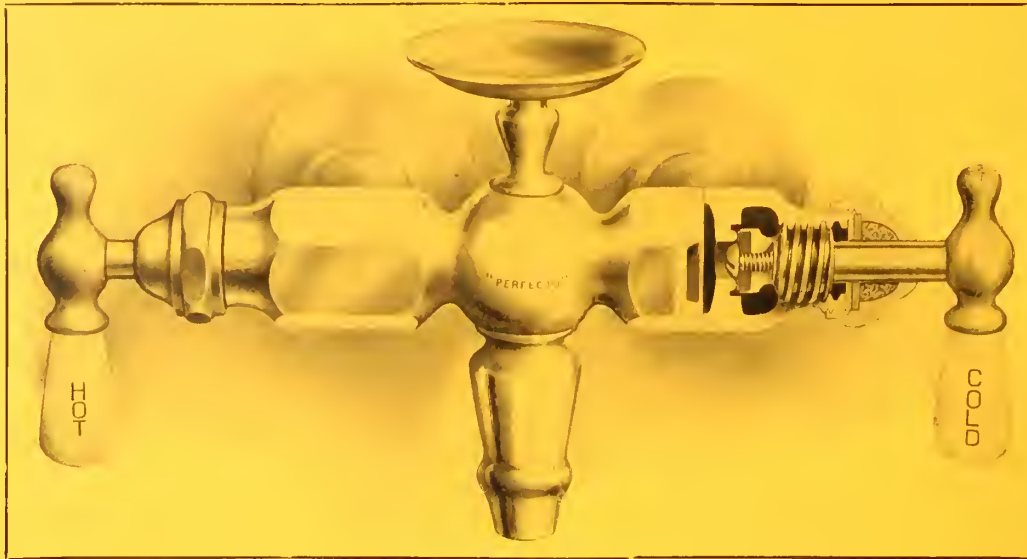
4½-in. and larger

Write at once for our new catalogue No. 5 and destroy all previous issues.

The Kerr Engine Co., Limited, MANUFACTURERS
Walkerville, Ontario

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

GALT BRASS Co. LIMITED



"PERFECTO" (REG. 1913)

Use the "Perfecto" when in a hurry—
Saves half the time and all the worry.

THE **"PERFECTO"** BATH COCK is a modern achievement in the quick-pressure or rapid-opening type, giving you lever action, and largest waterway made, coupled with a very attractive design.

HIGH-GRADE
BRASS
AT
MODERATE PRICES

Guarantee

ANY ARTICLE OF OUR
MAKE, PROVING DEFECTIVE
THROUGH INFERIOR METAL
OR IMPROPER WORKMAN-
SHIP ON OUR PART, WILL BE
REPLACED WITH TWO GOOD
ONES AT **NO CHARGE** TO YOU.

GALT BRASS Co. Limited

A
COMPLETE LINE
OF
PLUMBERS' SUPPLIES

GALT BRASS CO. LIMITED

GALT, CANADA

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Calgary
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Toronto

L. McKenzie
T. H. McLaren
R. S. Alexander

Phone M. 5810
" 424L
" J. 4950

Maritime Distributors:

Wm. Stairs, Son & Morrow, Ltd., Halifax

THE SANITARY ENGINEER PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

Publication Office : TORONTO, NOVEMBER 2, 1914

No. 21

Standard
Ideal

"Improved" Sink Strainer

We put it in at the Factory and it stays "Put"

Furnished With All Roll Rim and Flat Rim Sinks



FIG. 1
Fig. 1. Illustration of
"IMPROVED" SINK STRAINER.



FIG. 2

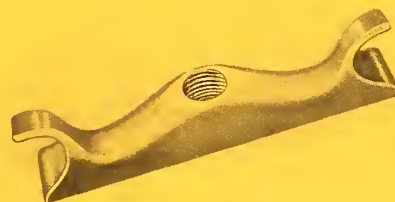


FIG. 3
Fig. 3. Cross-bar used with our new
"IMPROVED" SINK STRAINER.

Fig. 2. Cross-section showing method of attaching "IMPROVED" STRAINER to the Sink Outlet.

We have been supplying all of our sinks with this new strainer for some time and judging from reports received it has been a real selling feature of our sinks. It is undoubtedly one of the best strainers on the market to-day.

Circular explaining in detail the advantages of this strainer was mailed to you some months ago. If you didn't receive a copy, a duplicate will be mailed on application.

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

TORONTO
119 King St. East

MONTREAL
42-44 Beaver Hall Hill

WINNIPEG
76-82 Lombard St.

VANCOUVER
410 Carter Cotton Bldg.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.

These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

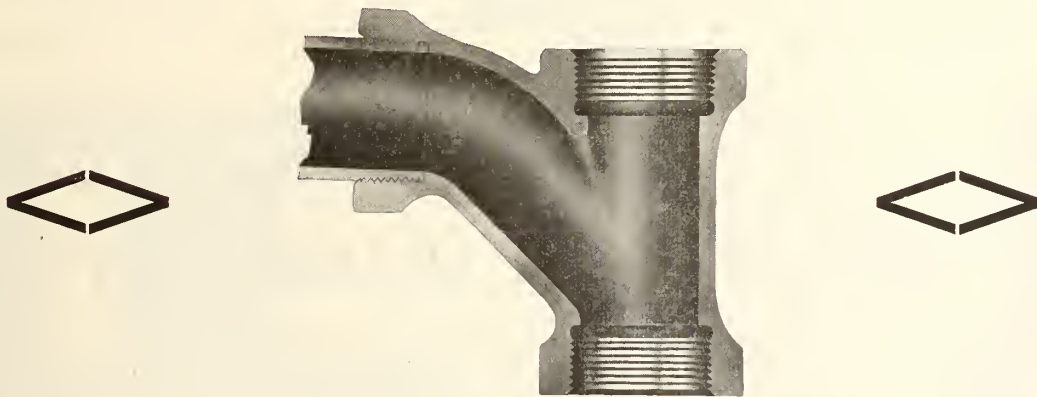
ONTARIO:
Monarch Brass Mfg. Co.,
178 Victoria St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes,
120 Lombard St., Winnipeg

BRITISH COLUMBIA:
A. O. Campbell,
864 Cambie St., Vancouver

RECESSED DRAINAGE FITTINGS

**We are now Manufacturing
a complete line**



FITTINGS LIMITED OSHAWA

MONTREAL

WINNIPEG

VANCOUVER

INSURE your JOB
by using
B-O-T Tanks and Seats
which are
GUARANTEED for 5 YEARS

CONSTRUCTION: Tanks are lock-dovetail jointed. Seats are Spiral-dowel jointed. Linings are Double lock seamed. Guaranteed fittings. Tested under working conditions at varying pressure. Write for our Catalogue. All enquiries cheerfully answered.

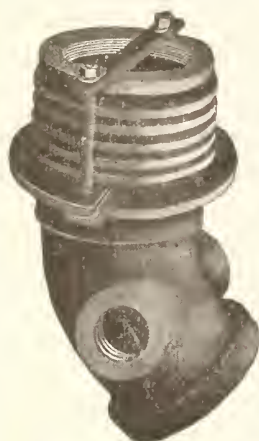
THE B-O-T MFG. CO., LTD.
B-O-T BUILDING

159 Richmond St. West

TORONTO

MONTREAL OFFICE:
68 Beaver Hall Hill

WINNIPEG OFFICE:
405 Tribune Bldg.



J-M 45° Closet Bend
for Durham System.

**With the Price of Solder Going Up
It Pays More Than Ever to Use**

J-M SANITARY CLOSET FITTINGS

The price of tin has taken a big jump, and probably will rise higher. As the solder you use is from one-quarter to more than one-half tin, you can see that wiping joints will be an added expense to you, and one for which you can't very well charge.

By using J-M Sanitary Closet Fittings you not only save the cost of solder but you install the fittings in less than half the time required by ordinary fittings. Another worthwhile saving is thus made on every contract.

J-M Sanitary Closet Fittings are made of extra heavy cast iron. Each fitting has a series of integral flanges on one end which can be readily removed with a cold chisel and hammer to make the fitting the correct length. The spigot end has a number of serrations to make cutting easy. An adjusting ring allows the closet bowl to be turned to any angle. Styles to meet all requirements.

Write our nearest branch for illustrated booklet.

**The Canadian
H. W. Johns-Manville Co., Limited**

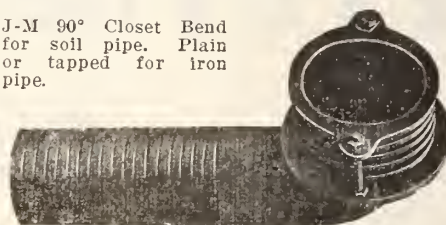
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Manufacturers of Plumbing Fixtures; Closet Seats; Flush Valves; Washerless Faucets; Copper Floats; Pipe Coverings; Pipe Joint Cement; Joint Runners; Packings; etc.



TORONTO MONTREAL WINNIPEG VANCOUVER

J-M 90° Closet Bend
for soil pipe. Plain
or tapped for iron
pipe.



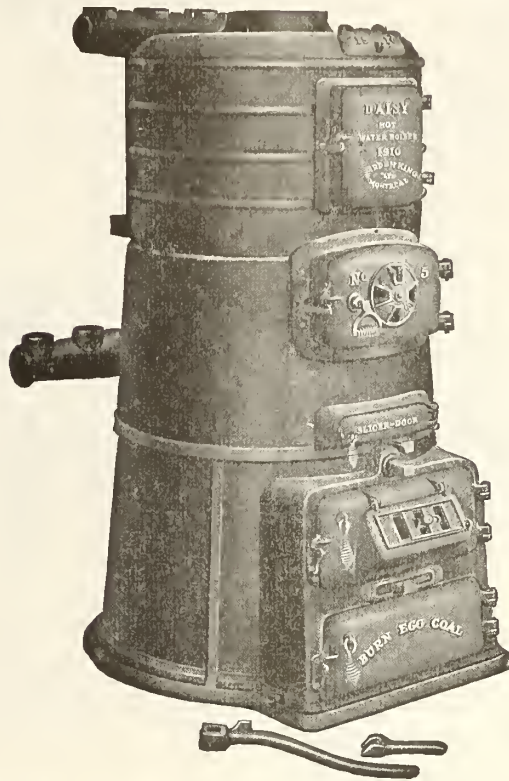
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THE DAISY BOILER

Over 55,000 DAISY Boilers

are giving the best of service throughout Canada.

The Daisy has qualities which make it a better proposition than any other on the market.



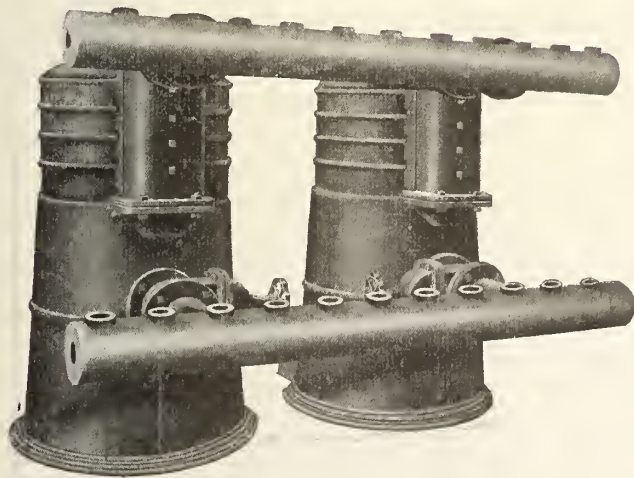
Made in the best equipped plant in Canada.

Without doubt the most popular boiler made.

Every installation means another customer satisfied.

Minimum consumption of fuel.

Maximum amount of heat.



Rear view of two Daisy Boilers connected with twin headers. This system gives great satisfaction in mild and extreme weather.

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BRANCH, 200 Adelaide St. West, TORONTO

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The WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

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**Filing
Down
Shop
Costs**

Are you already benefiting by the use of

NICHOLSON MADE FILES?

Are you enjoying a high degree of Filing-Efficiency with a very low Filing-Cost? These are the *ordinary* advantages of using NICHOLSON Brands.

But don't miss the *extraordinary* advantages of using MORE Nicholson-Made-Files.

Educate your workmen to throw away their half-worn files. Give them two to use where they now use one. In this way, you'll increase their output and accuracy to such an extent, that your *net* filing-cost will decrease 25% to 50%. Enough to pay many times over the slight increase in the cost of files.

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Nicholson File Co.
Port Hope, Ont.

"FILE PHILOSOPHY"—A 50 years' education on files in an hour, and our Catalogue, sent FREE on request.



**PERFECTION
FLOOR AND
CEILING PLATES**

300,000 always on stock.
Sizes from $\frac{3}{8}$ to 4 in.

The most popular plate is our No. 10 Hinged Pressed Steel or Brass. We manufacture all lines shown on cut.

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Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

Gas Companies and the Public demand a Strong, Durable Gas Mantle with a high candle power, and at popular prices. The Trade can now absolutely rely upon being able to supply such a mantle in the Laddite.

Awarded
Gold Medal
Franco-
British
Exhibition
1908.

Mantles
made and
supplied for
oil, gasoline
air gas,
acetylene,
and light-
houses.



**THE STAR OF THE
MANTLE WORLD**

"LADDITE"

The Mantle HARDENS
and INCREASES in
Candle Power as it burns

Full
particulars
of the
merits of
the Laddite,
together
with terms
for
wholesale
and retail
trade,
furnished on
application.

Millions of Laddite Mantles now in use throughout Great Britain and abroad.

Manufacturers under the "Laddite Process."

The Hamilton Gas Mantle Co.
LIMITED

18-24 Ferguson Ave. N., Hamilton, Ont.

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FORMER RESIDENCE OF THE LATE QUEEN VICTORIA OF ENGLAND



ROYAL PALACE OF LA MAGDALENA
SUMMER RESIDENCE OF THE KING AND QUEEN OF SPAIN



SANDRINGHAM HOUSE
COUNTRY RESIDENCE OF THE KING AND QUEEN OF ENGLAND

Royal Palaces in which "Standard Sanitary" Plumbing Fixtures were installed—a few notable examples of their world-wide popularity

"Standard Sanitary" Plumbing Fixtures can be obtained anywhere in the Dominion. They are handled by leading Plumbers throughout the provinces and are carried in stock by Jobbers and Sales Agents throughout the Dominion of Canada, thus facilitating prompt deliveries.

Standard Sanitary Mfg. Co.

Limited

General Offices and Factory: Royce and Lansdowne Aves., Toronto, Ontario

TORONTO STORE

55-59 Richmond Street, West

HAMILTON STORE

20-28 Jackson Street, West



BALMORAL CASTLE
SCOTTISH RESIDENCE OF THE KING AND QUEEN OF ENGLAND



THE QUIRINAL
OFFICIAL RESIDENCE OF THE KING AND QUEEN OF ITALY, ROME



BUCKINGHAM PALACE
OFFICIAL RESIDENCE OF THE KING AND QUEEN OF ENGLAND, LONDON



PALACE OF THE KING OF THE BELGIANS
BRUSSELS



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COMPRESSION BATH COCK

Fuller Pattern—China Index Handles



As easy to operate as a regular Fuller.

Note:—Beauty of design and construction.

The handsomest and best bath cock on the market.

Furnished with brass handles also if so specified.

Made in Canada.

Price Reasonable.

Nough Said.

Manufactured by

Canadian Wolverine Company, Limited
CHATHAM, ONT.

SOMETHING NEW



THE GEYSER AUTOMATIC WATER HEATER

is composed of a vertical cylinder from four to six feet long, according to size. The cylinder contains brass pipes which receive the steam and transmit heat to the water. These pipes are screwed to the base chamber, but remain independent from one another at the top, consequently, the expansion is entirely free, and leaks are impossible.

FULLY GUARANTEED
MANUFACTURED BY
THE E. S. MANN CO.,
MONTREAL

300,000 lbs.

carried in stock for immediate
shipment of

Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

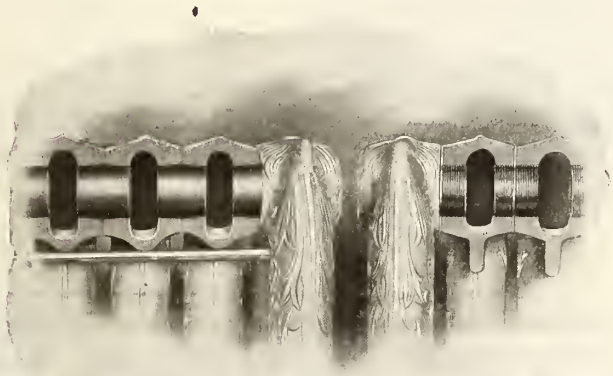
Brass and Copper Rod.

Brass and Copper Sheet.

WRITE US FOR PRICES

Tallman Brass & Metal Co.
HAMILTON, ONT.

There are 2 Ways to Join Radiator Sections



This illustration shows, on the left, the "push nipple joint" and on the right, the "screw nipple joint."

Radiator sections are joined in two ways, with a push nipple or with a screw nipple.

On the face of it, the screw nipple would seem to be best, but is it?

A right and left hand thread, we all know, cannot possibly bring two surfaces together.

And a screw nipple joint must allow for this. Therefore, the space between the two radiator sections must be taken up with a gasket, generally made of paper.

This is unavoidable.

Therefore, the life of the joint when a screw nipple joint is not the life of the radiator itself, but **the life of the gasket**. And if a leak should occur in a screw-nipple-joined radiator, it must be taken apart **section by section**.

Now consider the "push nipple joint." This nipple is tapered from each edge to the centre. The openings in the radiator sections are tapered the same way. The nipples are placed between the sections and forced into the openings under great pressure.

The result is an **iron-to-iron joint** without any space or gasket between.

Each is subject to the same degree of expansion and contraction.

And if you should want to lengthen or shorten a radiator, or mend a leak (which is much less likely to occur) the sections are pryed apart **at exactly the required point**, and forced together with a mallet.

The Gurney-Oxford Radiator is made in either way, push nipple or screw nipple.

You are the doctor. You specify which you want. But for accuracy, durability and convenience, we think the push nipple principle has a few points on any system of joining radiator sections yet devised. But this you can be sure of: there are no better radiators made than Gurney-Oxford, **no matter which way they are joined**.



THE
Gurney Foundry Co., Limited

Established 1843

TORONTO



Messrs.
BRUNNER, MOND
& Co., ENGLAND,
Have the finest Industrial Bath Installation in Europe.

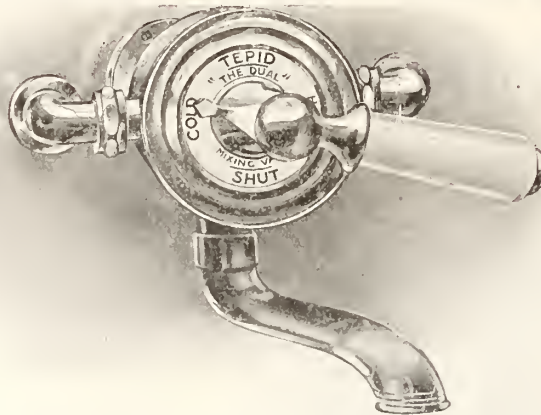
**OVER 2000
EMPLOYEES**

are provided for.

This is the Valve
used.

Made in England
by GUMMERS Ltd.,
ROTHERHAM

**THE DUAL VALVE
IS THE FINEST MIXER YET PRODUCED**



This Mixer is strong
and well built.

It can be taken to
pieces without disturbing
connections. Made in
various types for Baths,
Lavatories, etc.; also
special stock pattern
with one or two outlets,
at option for making
up sets.

Send for booklet to

Geo. Carpenter,
314 University St.,
Montreal
Canadian Agent

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



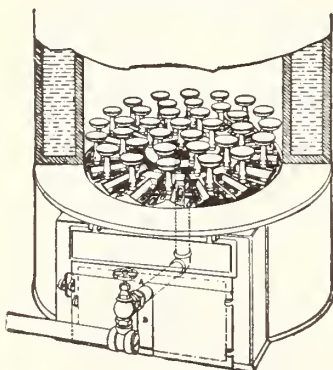
Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal

Works: Lachine Canal

In a Round Boiler.



"Standard" Gas Saving Burners

Every Plumber or Gas Fitter is interested in applying the **Right Burner** to the heater used for warming—that is: the Steam or Hot Water or Hot Air Furnace whether it be in the house, the church, store, school building, or other buildings.

The "Standard" Gas Saving Burner is the **Right Burner** for this service. "Standard" Burners produce the largest amount of heat for consumption of gas. Instructions for installing furnished with each burner.

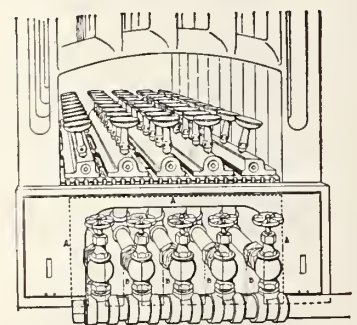
More than ten years manufacturing the "Standard" Burner—many in use.

Standard Heating & Radiator Co.

Manufacturers

Write for Catalogue Pittsburgh, Pa., U.S.A.

In a Square Boiler.



TWO CENTS PER WORD

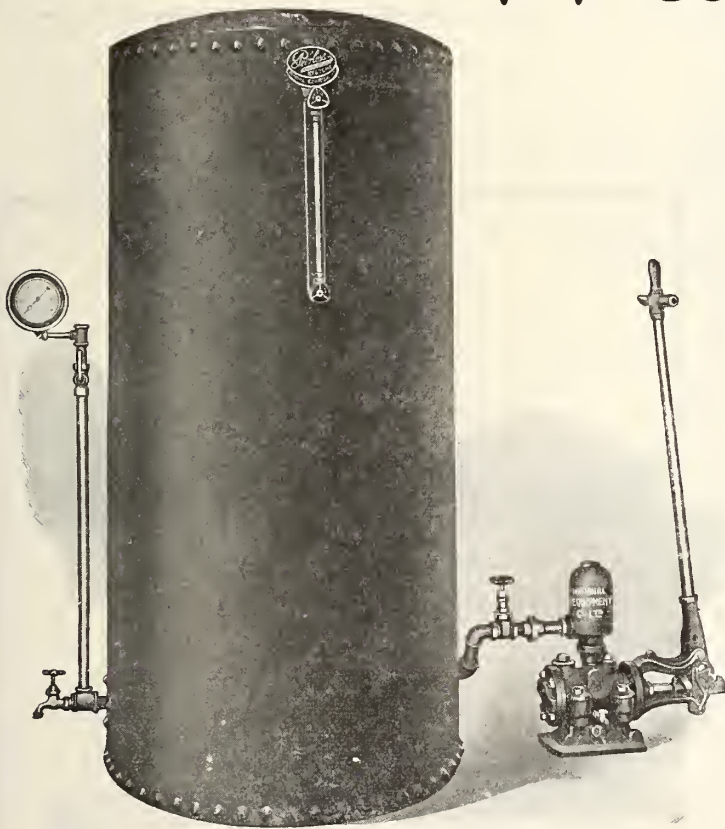
You can talk across the continent for two cents per word with a WANTED AD. in this paper

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

A NEW DISCOUNT OF 35%

Will apply, until further notice, to our
lists on Hand-Operated

Peerless Water Systems



This is the Lowest Price
at which this kind of goods was
ever sold in Canada.

Our Improved facilities
make it possible.

That our men may be kept
at work makes it desirable.

Are you importing any
goods that you might just
as well buy at home?

National Equipment Co., Limited
Toronto, Canada

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

It doesn't cost

us much more to make **SYDENHAM** goods than it does to make the cheaper kind, and it certainly pays to use them on every job when the **best** is required and your **reputation** is to be maintained.

EVERY PIECE
GUARANTEED

Sold by jobbers from
coast to coast

Made by

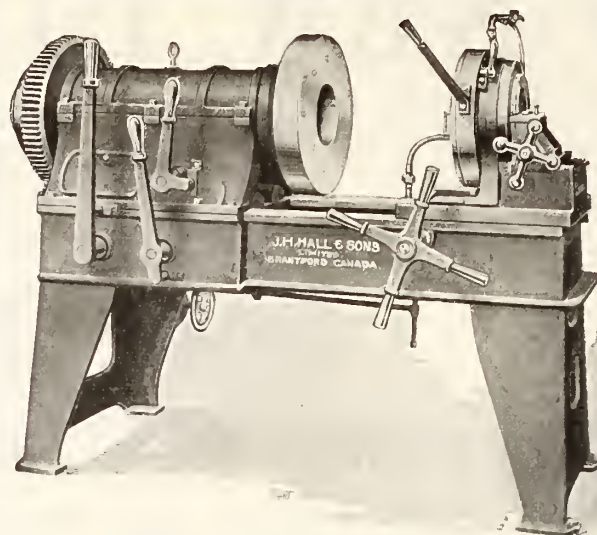
**THE WALLACEBURG BRASS & IRON
MANUFACTURING CO., LIMITED**

WALLACEBURG, ONTARIO

Winnipeg,
Moncrieff & Endress, Ltd.
Scott Bldg.

Toronto,
L. N. Vanstone,
8-10 Wellington St. E.

Montreal,
J. R. Devereux,
142 St. Joseph Boulevard West



[MADE IN CANADA]

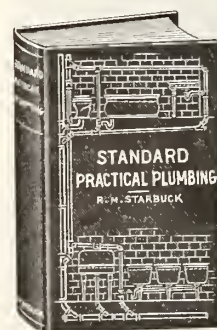
THE HALL NO. 6 PIPE MACHINE

When you buy Hall Machinery you keep Canadians employed. We are a Canadian firm, employing none but Canadian labor. Our guarantees are not at "Long Distance." We are at your door.

Our Machinery is the best that mechanical ability can produce and do not cost as much as imported machinery.

Write us for catalog and prices on pipe-threading lathes, any capacity, from ¼ to 18-in., also single and double head rapid nipple machines. No delays, delivery from stock.

JOHN H. HALL & SONS, Limited
BRANTFORD, CANADA



A WANTABLE BOOK

Standard Practical Plumbing

By R. M. Starbuck

347 SPECIALLY MADE ILLUSTRATIONS

PRICE \$3.00

"Standard Practical Plumbing" is indispensable to the Master Plumber, the Journeyman Plumber, and the Apprentice Plumber. As the book is specially strong in the exhaustive treatment of the skilled work of the plumber, it commends itself at once to every one working in any branch of the plumbing trade. Send for it to-day.

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MACLEAN PUBLISHING COMPANY

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Dunham VAPOR Heating System

The ideal system within the reach of every contractor and owner.

Not a complicated piece of apparatus at a great big price, but a simple, reliable and in all an economical system at a moderate cost.

Simplicity:—Nothing is good that is not simple. The Dunham Vapor System requires but little attention and no expert knowledge for operating or installing.

Durability:—Its parts—The Dunham Radiator Trap—Dunham Packless Inlet Valve—Dunham Pressure and Temperature Control are all of proven quality and guaranteed for wear and service.

Reliability:—Simplicity of control makes it positive in action. Low pressure (atmosphere to 8 ounces) makes it free from possibility of damage. Dunham Radiator Trap eliminates all freeze up troubles.

Economy:—Its operation makes the Dunham Vapor System a veritable watchdog over the coal pile.

First cost is the attractive part as well. Applicable to—Residence, Store or Apartment Buildings. Unlimited opportunities for the live "Heating Contractor."

Send for Bulletin No. 11, so you will be prepared for the information we give you on "Vapor Heating" in the next few numbers of this journal.

"Made in Canada."

C. A. DUNHAM CO., Ltd., TORONTO, CAN.

MONTREAL—No. 24-11 St. Sacrament St.
FORT WILLIAM—Plumbing & Engineering Supply Co.
HALIFAX—General Contractors Supply Co., McCurdy Bldg.

VANCOUVER—520 Duncan Bldg.
CALGARY—Metals, Limited.
WINNIPEG—405 Tribune Bldg.



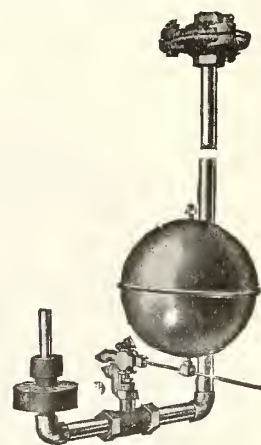
"Y" Branch
Double Plug

"CLIMAX"

Specialties

are the result of years of training and experience in this one line of manufacturing.

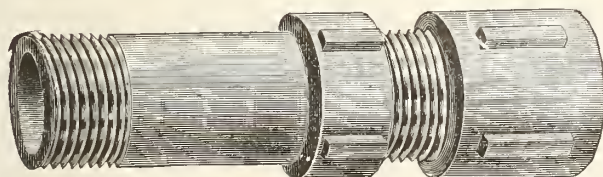
They are made to work right and give complete satisfaction.



"Climax" Cellar Drainer

**DURABLE
ECONOMICAL
EFFICIENT**

"CLIMAX" Specialties are Stocked by the Leading Canadian Jobbers.



Long Screw

THE C.M. **KEMP** MFG. CO.
405-413 E. OLIVER STREET
BALTIMORE, MD.

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SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, NOVEMBER 2, 1914

No. 21

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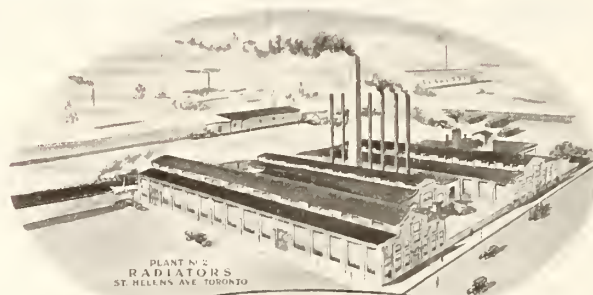
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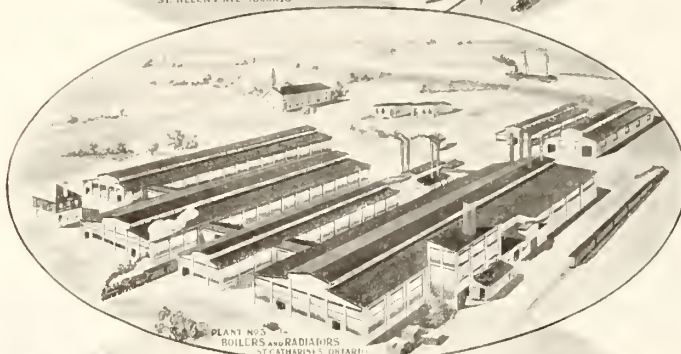


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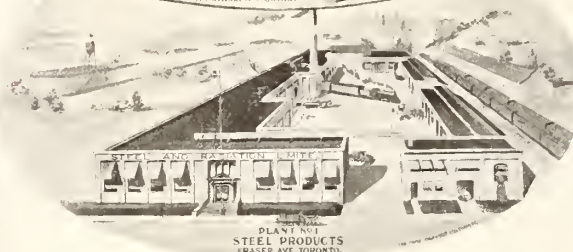
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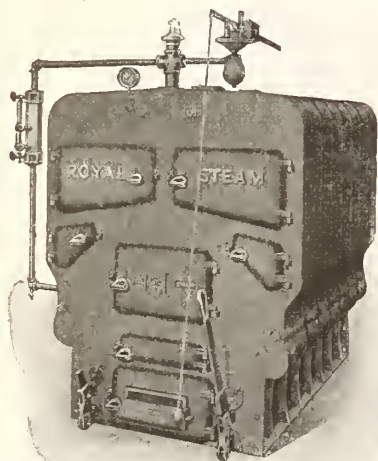
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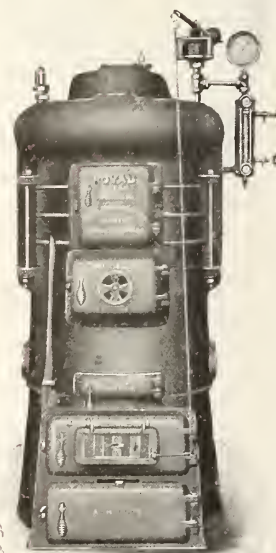


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THE SANITARY ENGINEER

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NOVEMBER 2, 1914.

No. 21

Simplified Sanitary Engineering Methods

Showing That to Simplify the Construction of Piping is More to be Desired Than Multiplicity of Piping—The Latter Does Not Necessarily Increase the Efficiency.

By Dr. Wm. Paul Gerhard, S.E., New York.

IN Figs. 92 and 93 is illustrated the arrangement of a row of fixtures, namely, two water closets, one basin and one bathtub, on a floor, all wasting to a five-inch soil pipe, B. On the next floor above are supposed to be a similar number of fixtures. It will be noticed that the lateral five-inch soil pipe branch is continued the full size—not reduced—receiving the basin and bath wastes each by a separate five-inch by two-inch Y

branch, and then it is continued up above the overflow point of these fixtures and connects with a vertical line of five-inch vent pipe. The bath and basin are each trapped by a non-siphoning trap, and the water closets are siphon or siphon-jet closets with a deep trap seal. Branch venting is entirely done away with and the plumbing simplified correspondingly.

When one or both closets are discharged, air follows through pipe D and

A, and the traps of basin or bath cannot be affected. The same is true when a discharge occurs through soil pipe B from the fixtures on the upper floor.

The arrangement of the piping for a group of single bathrooms, located vertically over each other (as in the case of apartment houses), is shown in Figs. 94 and 95. The plan Fig. 94, shows the bathroom to contain three plumbing fixtures, viz.: a water closet, a bathtub and a washstand. The open arrangement of

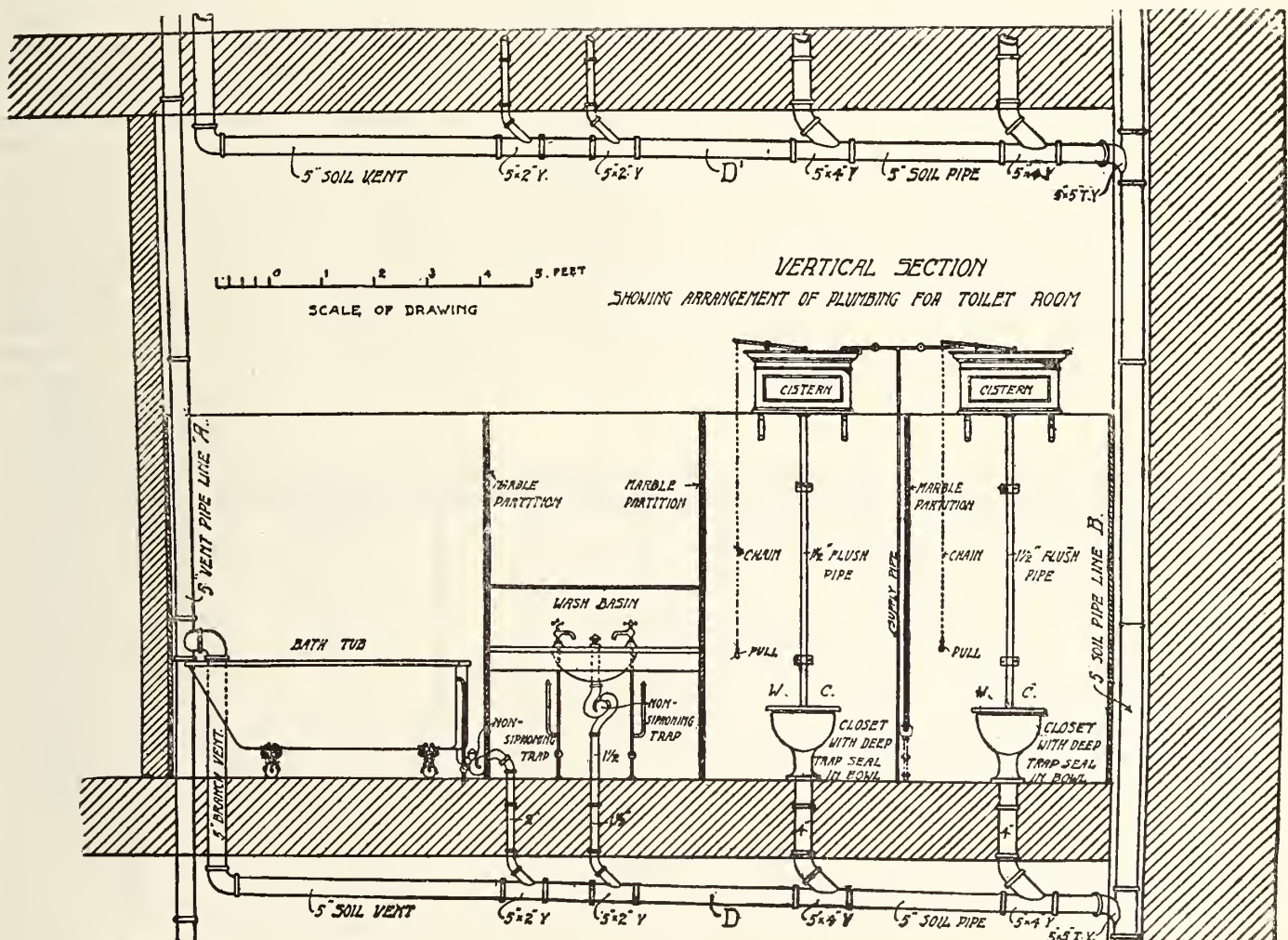


Fig. 92. Section showing simplified plumbing for group of hotel toilet rooms, with two w.c.'s, one basin and bathtub on each floor.

the fixtures is shown in vertical section, in Fig. 95. All fixtures waste into a vertical soil pipe line, five inches in diameter, placed in a recess of the outer wall near the bathroom window. Near the ceiling of each floor the main soil pipe has a five by four-inch T-Y branch, and a four-inch horizontal Y-fitting receives the branch from the water closet. Beyond this connection the horizontal branch is reduced to three inches in diameter and is continued along the ceiling to a point in a closet near the basin where it rises vertically to a height above the overflow point of the wash basin and then connects with a main vertical vent line, three inches in diameter. The bathtub wastes by a two-inch branch into the horizontal three-inch line, and the 1½-in. wash basin waste discharges into the vertical branch of the three-inch line, in order to wash out any rust which may lodge at the point where the horizontal and vertical parts of the line connect. On the next floor the arrangement is identically the same.

When the plumbing fixtures and their piping are arranged in the manner shown, there cannot be any danger of siphonage. No matter what fixture is discharged, provision is made for sufficient air supply to prevent any siphoning action upon the traps of adjoining fixtures. The piping consists essentially of a stack of soil pipe five inches in diameter, a stack of vent pipe three inches in diameter, and the horizontal three-inch branch connecting with both; each fixture is located within a few feet of a ventilated line, while all branch vent pipes are omitted as being unnecessary, and thus the plumbing becomes very much simplified.

In my practice, wherever I am left untrammelled by Board of health regulations, I use this, to my mind vastly superior, because safer, simpler and

cheaper system, and by numerous experiments I have demonstrated the fact that no siphonage can occur, and that the system is secure and efficient.

Let architects, builders and sanitary engineers but once try this system, and I am sure, if their judgment is unbiased, they will be convinced of the merits and simplicity of the new method.

A few good rules to observe in planning plumbing pipe systems according to the method advocated, are:

(1.) Always avoid those conditions which favor siphonage.

(2.) Do not make the soil pipes too small.

(3.) Never join small branch wastes together, but give to each an independent outlet into the larger waste or soil pipe.

(4.) Avoid all long dead ends.

(5.) Use traps or trap devices which maintain a water seal under all ordinary conditions.

One possible drawback lies in the fact that nearly all the non-siphoning traps at present obtainable in the market, are not fully self-cleansing. But then all traps in a house should anyway be cleaned out from time to time, so that this reduces the force of the objection. At the same time, a hint is contained herein to inventors who would, I believe, find ample ultimate remuneration by devoting their energies to the invention of a self-cleansing non-siphoning trap.

In my judgment, the authorities who make the plumbing laws should keep themselves thoroughly posted about the progress of the art, and should examine without fear or favor, all devices calculated to preserve and maintain a sound water-seal against any possible air disturbances in the soil pipe system.

I claim that the rules drafted should be such as to secure a system which is as

simple as possible consistent with security and efficiency. Security against back-pressure, self-siphonage or loss by momentum, siphonage, evaporation and loss of seal by capillary attraction are the chief requirements and these are unquestionably attained by the method described. If the process of simplification should tend to give us even greater security, so much more will be gained. *Caeteris paribus*, the simplest and least costly system must necessarily be adjudged the best.

The trap vent law will, in my judgment, ultimately be repealed. Simpler and better methods will take its place. The first initiative step to be taken consists in so modifying the present law, as to leave the option with the owners, architects or sanitary engineers of buildings to choose between the simpler, better and less expensive, advanced method, or the antiquated, costly and in a good many respects, unsafe method.

The simplification of plumbing methods advocated in the preceding pages, is to my mind, of such importance as to render it of interest to read in this connection some of the verdicts as passed upon the same by the technical press. I offer no apology for reprinting them in full.

One of the leading architectural papers in the United States, the *American Architect*, of Boston, expressed itself, in its issue of January 30, 1897, as follows:

It is always a pleasure to architects to read what Mr. William Paul Gerhard writes on matters of sanitation. Alone, almost, among those who treat of such subjects in these days, he writes like an engineer familiar with all methods and appliances in use, judging them with the aid of long experience and thorough theoretical knowledge, and dispassionately choosing what he believes to be the best

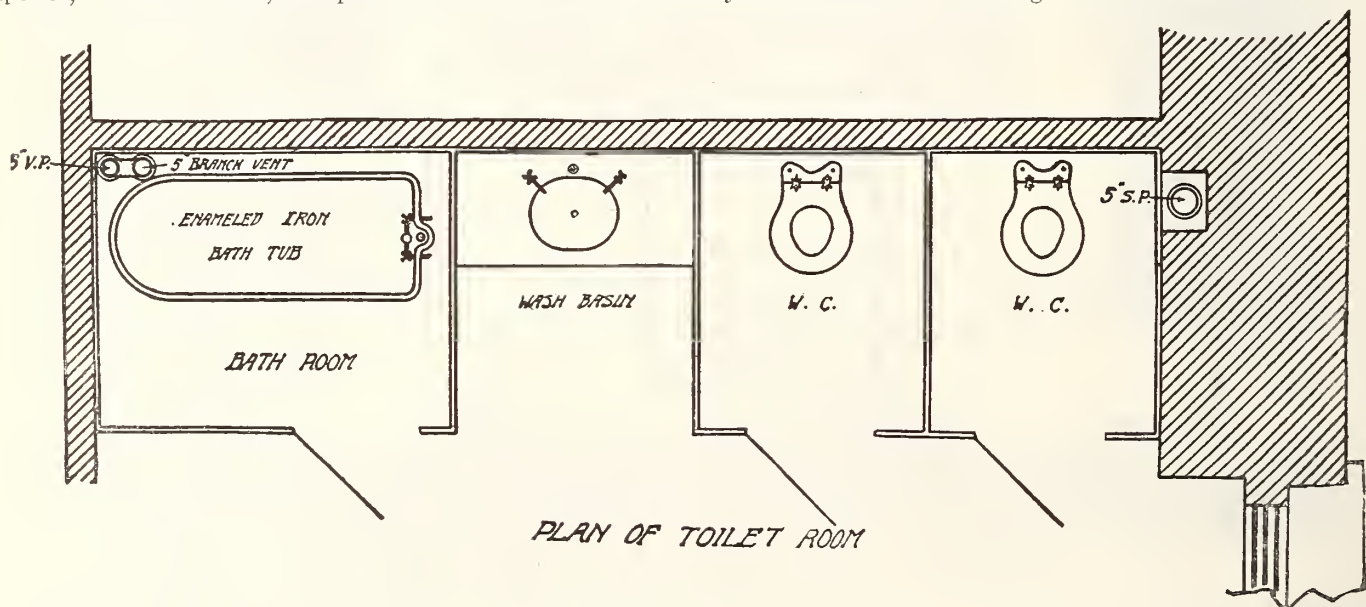


Fig. 93.—Plan of toilet room shown in section in Fig. 92.

thing attainable, without any reservations, exaggerations and misrepresentations on behalf of pet theories, or the private interest of himself or his friends. For this reason it is particularly noteworthy that he should have come out in this little pamphlet of a dozen pages against the system of indiscriminate trap venting which is now imposed by law on architects and plumbers in most of our large cities. It has long been understood that Mr. Gerhard did not favor indiscriminate trap venting, but, like the other professional men concerned with building matters, he has found it best to sacrifice his private opinions and submit quietly to the law, and it is only a growing conviction of the danger to health involved in the multiplication of pipes and joints which the laws render compulsory, that can have led him to protest publicly against the enforced use of the present "antiquated costly and in a good many respects unsafe methods." The reasons which he gives for this protest are convincing enough to all those who have to do with building. As architects know, in the execution of a complicated piece of plumbing work under the present law, it is almost impossible to avoid such intercommunication of waste pipes and vent pipes as to form here and there a "bypass," or in other words, an open conduit for leading sewer air from the waste pipes directly into the rooms around the traps. Many a plumbing plan is rejected by boards of health, because it provides, of course unintentionally, for such a bypass at the outset, and many more systems, properly planned, are rendered dangerous by the carelessness of workmen in making connections. The only real reason that has ever existed for back-venting traps was to prevent them from being siphoned out by the suction from a main waste pipe discharging water enough nearly to fill it. Twenty years ago, when S-traps were in common use, this was a valid reason; but now, when non-siphoning traps are almost universally employed, there is no advantage in the venting system which cannot be better secured by using a five-inch soil pipe in place of a four-inch, carrying up the longer branches to the roof, and placing modern traps under the fixtures. There is, of course, no objection to back-venting a trap, especially if its situation, or other circumstances, should render this desirable; but this ought, as Mr. Gerhard says, to be left to the discretion of the architect or engineer, or, if desirable, to that of the official inspector.

S. Weisman has disposed of his business to the Vegreville Plumbing and Heating Co., who have opened a new establishment opposite Gordon's Factory, Vegreville.

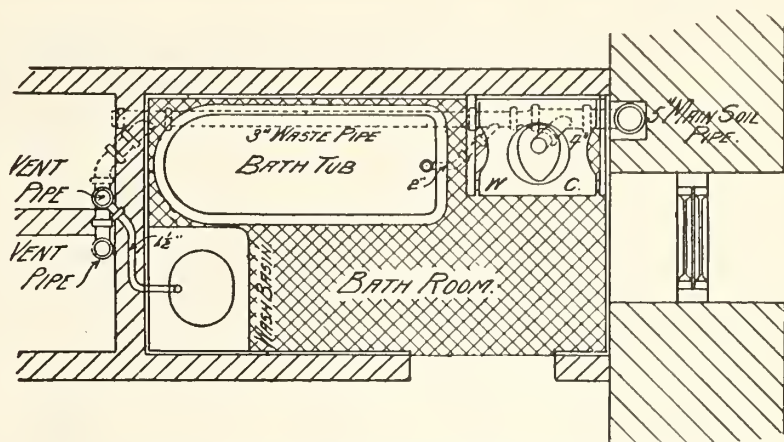


Fig. 94.—Plan of bathroom (the section and arrangement of the plumbing for same are shown in Fig. 95.)

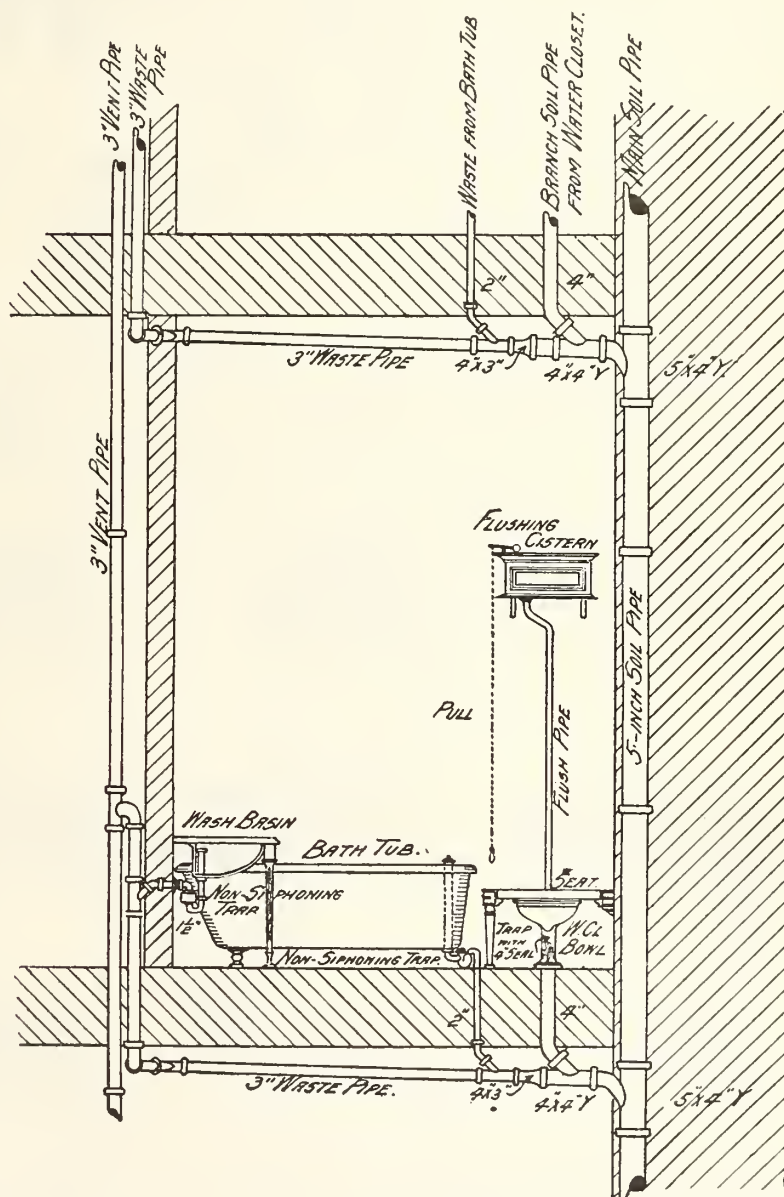


Fig. 95.—Section of simplified plumbing for a group of bathrooms located vertically over each other.

Heating and Ventilation Past, Present and Future

These Articles Will Take up the Simplest Methods Adopted in the Past, the Present and the Possible Methods for the Future, and Will be Written as Free From Technical Phraseology as Possible, so as to be Within the Scope of the Lay Mind.

THE NEXT in simplicity to a one-pipe steam system, is that of an air line system. This is really a one-pipe system with an air line connected to the air valves. Originally this system was used as a means of draining any slight quantity of water, as well as air from the air valves, to a point where the furnace man could see it, as shown in Fig. 1. Then from this simple system was evolved the Paul system of steam heating, which is a form of vacuum heating system.

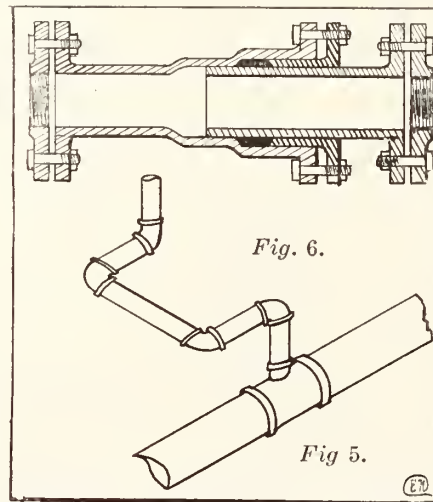
The worst trouble with all steam systems is that of getting rid of the air. It is a very slow process, trying to force the air out with steam. To do this requires a higher pressure than the usual.

If our reader will stand at an air valve when steam is being raised, and open the valve, it will be found that cold air, sometimes water, then a warm vapor is emitted. Then steam, and again cold air, and so on. The same takes place with any air valve, when steam is being raised. The closing the air valve is a far more serious matter, than we are apt to think.

The air valve to give good service should be of such a make as to respond

in a very efficient manner, and like the return trap, should open to air and water, and close to steam.

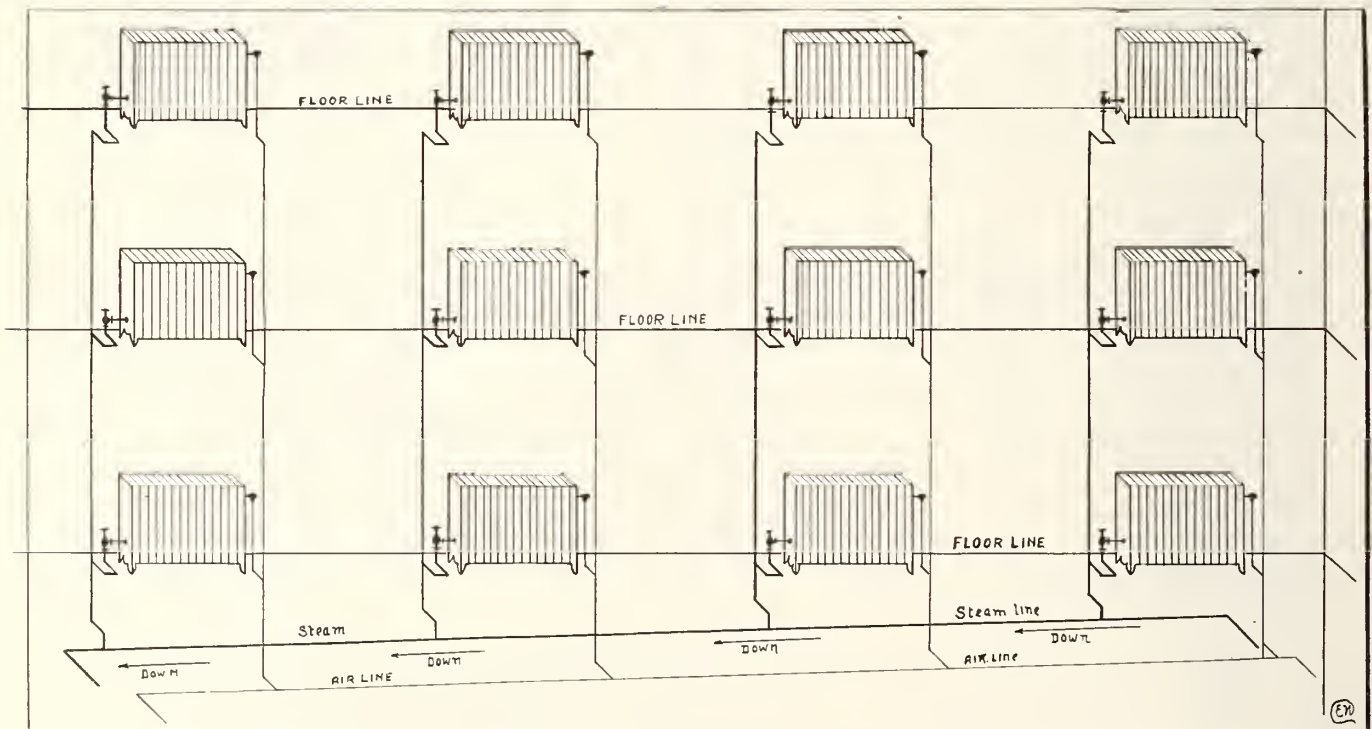
One of the latest of these air line valves is manufactured by the C. A.



will be seen is an ordinary one-pipe steam system. When such a system, or in fact any steam system is being installed in very high buildings, special attention should be paid to the expansion on the risers. This can be overcome in various ways. See Fig. 5. Fig. 1 shows a popular method of radiator connection on steam lines. Like a plain one-pipe system, the mains, risers, and connections should be one size larger than when a two-pipe system is being installed. All horizontal branches to radiators should be one size larger than the connection at the radiator, that is when the system is expected to be noiseless, Fig. 6 shows an ordinary expansion joint, which may be used on either risers or horizontal mains. When using such a joint it will be necessary to use the very best packing that can be procured, which will not deteriorate easily, because as a matter of fact, it is always moving, especially where there is a variation of steam pressure as well as temperature to allow for.

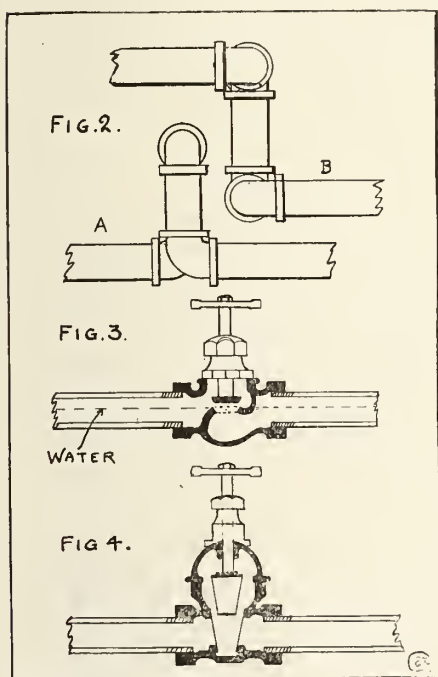
Fig. 2, A and B shows another method of taking care of expansion. B would require to be at the lower end of the main, and in a one-pipe system that end would be the farthest away from the

Dunham Co., Toronto. It is connected in exactly the same way as the ordinary air valve. Fig. 1 shows the ordinary layout of an air-line system, which as



Common air line system. Note the method of connecting each radiator to overcome expansion, both at radiators and on risers.

boiler, so that the change in levels would not cause the condensation to be trapped. Fig. 3 shows the interior view of a pipe line with globe valve in sectional view. It is strange to see the amount of globe valves which have been used on steam lines, and which are even to-day being installed by heating engineers. Globe valves would not be used in such a manner if the engineer had any idea of their construction. The writer not many years ago was called upon to remedy some troubles in a large heating plant, and found nothing but Globe valves in use, and nearly all on the horizontal, as shown in Fig. 3. As we stated before, such valves should not be used, even if they are installed as they often are at an incline down with wheel handle about 45 degrees, because while not quite as much condensation collects at the valve,



it has been found that dirt, grit and sealings from the pipe would collect in the bonnet and prevent the spindle from working right. Fig. 4 shows a sectional view of gate valve, which is the best valve to use, even these valves should not be placed in any position but either straight up as shown or at about 45 degrees up (not down) the same trouble with scale, etc., will be experienced if placed looking down, though not to as great a degree as with a globe valve, on account of there being a straight throughway and little or no obstruction.

(Continued in next issue.)

SAVING ON TRIFLES

A telephone call when a letter will do; twice the paper or twine that the package can use; an errand boy's five-minute job done by an eighteen-dollar clerk; an order neglected until an apology or a

This table will be found useful to those installing a one-pipe system.

Sq. Feet of Radiation per Radiator.	Size of Pipe.
10 to 24 feet.	1 inch pipe.
24 " 60 "	1 1/4 " "
60 " 80 "	1 1/2 " "
80 " 130 "	2 " "

All horizontal branches to be one size larger than radiator connection. See illustrations.

The Trade That Was Germany's

Some benefits that Canada might derive from Europe's war are denied us by restrictions of Empire patriotism. The keenest Canadian business man would not willingly profit to-day by a situation that handicaps the Mother Country.

But in the field of commercial activity now open to Canadian manufacturers, there are now—by reason of this unsought war—various opportunities for us, which mean loss to none other than Germany.

Much of the trade that was Germany's in Canada should now become our own. Who but our own Canadian manufacturers should now make the hosiery, the underwear, the paper, the toys, the silver, and much of the chemicals, dye-stuffs, and other things Germany has supplied us?

All this additional business, now so readily tending toward Canadian concerns, will be divided among them in proportions depending upon the aggressiveness with which they, respectively, go after such business.

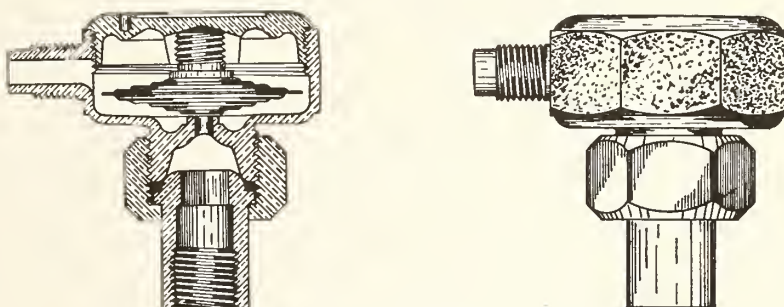
And in that aggressiveness, as in all commercial campaigning, ADVERTISING must be an important factor.

Doubly important right now—because this trade that was Germany's is going to be apportioned among our factories at once. Our people must have these things—not six months or a year hence—they are buying them now. Stocks are running low, and the firms that ask most insistently for their share are going to get it—large and quickly.

It will be a test.

Advertising will soon reveal which of our industrial enterprises are most worthy and best prepared to profit by Germany's set-back. The firms first to advertise for this business that was Germany's will be the first to profit and the ones to profit most largely when that business becomes Canada's.

Who, among our Canadian manufacturers, is willing to be left out in the cold? Who, among such firms, will fail to advertise?



Showing section of C. A. Dunham Co. air line valve.

special delivery stamp or a telegram is essential; these and their kin are such trifling matters and are happening with much frequency, but is not your business built on profits often as small as these

assumedly inconsequential matters? Any kind of waste is just so much money thrown away—and you are not yet rich enough to do that—probably never will be.

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TORONTO, NOVEMBER 2, 1914

Military Hygiene and Sanitation

IT may appear absurd to speak of the conservation of human life, at a time when almost the entire continent of Europe is engaged in a relentless struggle. Modern military equipment and methods are expressly designed to waste human life and it appears inevitable that so long as nations continue to resort to arms for redress of real or fancied wrongs, so long will periodic ravages of the race recur. Nevertheless, much of the sacrifice to Mars that has blotted the record of the ages has been wholly unnecessary, and might have been avoided had military leaders exercised even the most rudimentary precautionary measures in respect to the care of troops in the field. During most of the great European wars, fever and cholera more than the bullet and the bayonet have thinned the ranks and swept away entire regiments. To check this loss, a pure waste from the point of view of military efficiency as well as from that of humanity, the new science of military sanitation has developed, not yet perfected by any means, but following and paralleling the progress of civil hygiene. Referring to the practice of this science, one may, therefore, speak of conservation of life even in the throes of war and leaders may endeavor to offset the cruel slaughter of the battlefields by minimizing the terrible drain of life due to the faults of camp and commissariat. The sanitary service of an army must reach the acme of efficiency and make all efforts to furnish soldiers with pure food and water, proper and sufficient clothing, and well located and drained encampments, especially when it is necessary to go into winter quarters.

Gen. Sir Horace L. Smith-Dorrien's introduction to the "Handbook of Military Sanitation" furnishes some striking information and data which illustrates just to what extent the toll of life exacted by warfare may be decreased. It is pointed out that, even as late in the history of modern warfare as the South African war, twenty times as many hospital patients were treated for two diseases alone, namely, enteric fever and dysentery, as for wounds, injuries, and accidents combined. During the Russian-Japanese struggle, however, the excellent management of the Japanese army marked a decided improvement in the care of troops in the field, and it is to be hoped that the same satisfactory conditions will characterize all succeeding struggles of nations.

If wars must occur, many human lives must be lost. While that part of the loss which is due to

disease can be minimized, too much cannot be expected in view of the restrictions upon sanitary methods necessarily imposed by campaign contingencies. Nevertheless, that government which fails to take every possible precaution and preventive measure is guilty of the wilful sacrifice of the nation's best blood.

Cutting Down Expenses

WE have heard a great deal recently about cutting down expenses. The war has "played war" with us in more ways than one. It has unbalanced many minds in all walks of business life. This has actually cost Canadian trade more than has the war, to date. We have to some extent recovered from the shock and find that business, while not as good as we would like it, is not by any means as bad as we felt it would be. The first shock did two things: It showed us our strength and gave us a view of ourselves; it made us as it were "know ourselves." The worker became alarmed and foresaw harder times than are going to be experienced. The storekeeper's vision was high prices looming ahead. The business man could see nothing but cutting down expenses. What expenses? The business man who tries to cut out "unnecessary expenses" when something happens, should be relegated to the scrap heap. The very act proves his inefficiency, because those "unnecessary expenses" should never have existed in the first place. War is not necessary to make him begin such cutting. Cutting down expenses which are necessary is like knocking down the props which hold the business up. Therefore, before knocking down any of the props, they should be examined. Some concerns cut out advertising and felt they were saving so much money, but in actual fact they were knocking down props which kept their products high up before the eye of every buyer of such goods. Advertising to a business, is like powder to the bullet, cut down the amount of powder and the bullet will not reach home. The same with unnecessary expenses (unnecessary, we said), if there are any such expenses, it would be like too much powder in the cartridge and such a condition would soon "bust the gun or wreck the business."

We feel, however, that before any cutting down be resorted to, a thorough study should be given to the matter for fear, in the first place, that we cut down the wrong prop, thereby wrecking our business or demoralizing our organizations.

Business as Usual

IF the present state of business could be termed "Business as Usual" with sanitary and heating engineers, it would be anything but good for the craft. Business is not as usual, and while we know that such a "slogan" is all very well, and we are by no means pessimistic, we know that business is not or yet is it likely to be "as usual" for some time to come.

Business is very "unusual," and to try and make ourselves believe otherwise would be about as futile as the Christian scientist trying to make a person of another religious persuasion believe he was not suffering from toothache, when the latter could swear by all above and below that he was. Now, simply because we know that business is not as usual is by no means reason for us to bemoan our lot. Rather, should we be up and doing, if we feel a twitching on the financial cords of our business. We should begin right now and examine every strand; we should examine our stock; put it in order and finance our own business from stock, to the very limit. If you have a Tee or an Ell, which is an odd size and can make it do by using a bushing, why bush it; that is of course if the cost of the bushing is not out of all proportion with the value of the fitting, but don't buy cheaper goods and hire cheaper men, and don't talk hard times to get a cut in price, because that will come back to you.

Keep a stiff upper lip, and realize that business is not as usual, but rather the reverse; get out after business, encourage your men to recognize the fact that the good ship "Business" is in a squall, that the war has torpedoed her, and all aboard have got to pump and pump hard. But while asking the crew to pump harder, don't say: "Business as Usual," or cut down the grog; but rather, get at the handle of the pump yourself and whisper to the crew that there's more grog for those who pump the hardest.

A Move for Heating Engineers

THE Toronto Board of Health issues a health bulletin every month to the school children, and the last one issued contained a very interesting article entitled "The Heating and Ventilating of our Homes." This in many ways endorses the stand which the Sanitary Engineer has taken many a time, and will do to the end, the article points out the great importance of proper heating and ventilation. This Canada of ours, is accursed by a big list of victims to tuberculosis. No other country has so large a per cent. and why? We have a severe climate; we close up our homes too tight, we pay no attention to the proper installation of heating systems and no provisions are made whatever for ventilation. We should hail with joy the time when we could see laws of health respecting heating and ventilation. Heating and ventilation are twin brothers as it were. Heating systems can be installed which will govern each other rather in a spontaneous manner than by any other way. The heating in our homes can be governed by several very simple devices. Ventilation too. Every city medical health officer is well aware of the fact, but they say it is too expensive to install such an appliance. We venture to say that in 90 houses out of every 100, we could find scores of knick-knacks, which are of absolutely no value as regards our vital welfare, and which if the cost of

them had been invested in a first-class heating and ventilating apparatus, would bring far better comfort and give a thousand times more service. We would like to see some progressive heating engineer fit up a small model heating plant, up-to-date in every detail and demonstrate to his patrons the splendid service which could be gotten by installing such a system. Somehow or other we heating engineers do not seem to have got the proper viewpoint of this business of ours. We figure on so many square feet of radiation as being sufficient, we calculate upon a certain boiler heating the amount of radiation which has been installed, and there seems to end the responsibility.

What is really required is that the heating engineer become more conversant with the facts, both as to the amount of heating, the style of radiation, the amount and position of the radiators, and also the required amount of ventilation, and not leave himself open to all kinds of criticism from the householder. The heating engineer should cease to be the catspaw of the speculative builder, and should get closer to the owner of the house. If a speculative builder wants heating in a house, the heating engineer should be the one to be consulted as to the proper quantity of radiation and size of boiler, and before such a state of affairs will prevail, he will need to get some by-laws drawn up and sanctioned by the civic authorities just as is the case with plumbing and sanitary engineering construction.

Spend Less, Invest More

WHEN a manufacturer wishes to reorganize or systematize his business, he calls in an expert, tells the expert what is wanted, and pays the price. Or if we become afflicted with some serious illness, we consult the very best specialist we can get and never haggle over price. But if we buy goods, we haggle and barter and "lie like troopers," so as to get a cut in price. It seems to be human with a very inhuman vein in it, and the worst part of it is, we generally get away with it, in a way, but we have to pay the piper mentally, and he that pipes last, pipes best.

We buy a bill of goods at our price, and 99 times out of a 100 we have actually got less than we paid for. The trouble is, we seem to be trying to make this good old world look like a 10 or 15-cent store, and end up in making ourselves look more like 2 cents. We think when we buy low-price brass goods for instance that we have done well, that we will be able to cut so and so out of a job because we got our goods at a lower price than he did. The man who thinks he is buying an article worth \$1 for 50 cents only thinks so, and the person who spends 50 cents on a low-priced article, instead of investing \$1 in a \$1 article, has spent 50 cents and it's gone. A piece of brass goods costing 75 cents and which by right should have been of a higher grade, costing \$1.25, is apt to cost more in the end; therefore sanitary engineers should just try to push higher grade goods, thus prevailing upon your customer to invest their money in goods which will give better and longer service, rather than upon cheap grade goods which in the end cost more. It only needs a little education along the lines of showing the public that you are not only selling goods, but also lasting service.

New Sanitary and Heating Goods

New Drinking Fountain.

If there is one thing more than another which is to be looked upon as a boon to humanity it is the abolition of the common drinking cup. And now that drinking fountains have come into being, we may look out for improvements in them from time to time. Some are in favor of a drinking fountain which is flowing continuously, and claim that in these the water is always cold. Be that as it may, it is a waste of water, and is not always cold. The Waterman Waterbury Manufacturing Company, Ltd., Re-

New Bibb Seat Dresser

One of the latest improved tools which sanitary and heating engineers should be interested in is that of the new Johnson bibb seat dresser. This new tool is claimed to be adaptable to inside or outside threaded bodies. It will fit any compression basin, sink, or bath cock, as well as valves from $\frac{3}{8}$ inch to $1\frac{1}{2}$ inch, and is substantially made: four sizes of cutters are supplied. Any further particulars may be had by applying to William Johnson, Hedenburg Works, Newark, N.J.

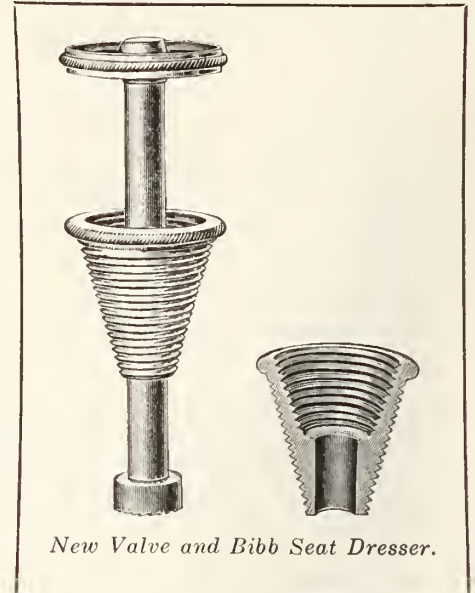


New 15-gallon Waterman Waterbury drinking fountain. Style C.C.

gina, have placed a drinking fountain on the market which has some very novel points worth considering. They claim they can give all the service and satisfaction which can be acquired in a town or city where waterworks are in operation. Any sanitary engineer wishing to cater to the rural districts should get in touch with the above company. Write for their various folders on the subject, which, to say the least, will be found to contain a lot of useful information.

A NEW SEWAGE LIFT PUMP.

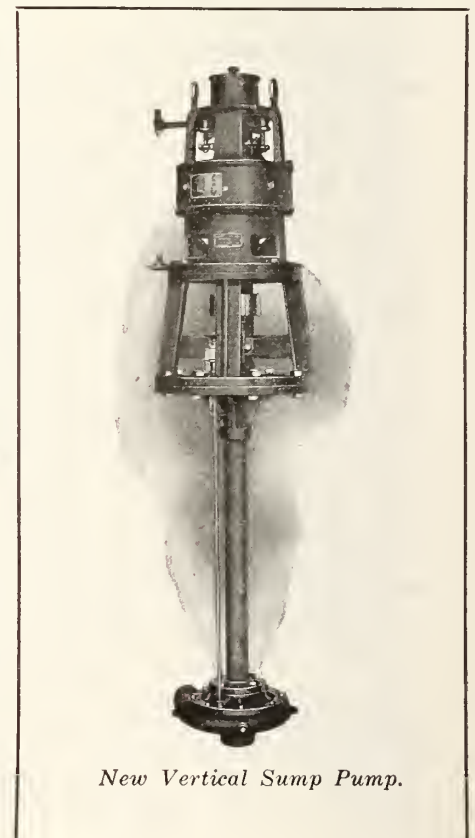
The accompanying illustration shows a vertical centrifugal pump, as built by the Smart-Turner Machine Co., Limited, Hamilton, Ont., for use in office buildings, and other places where the basement is below the sewer. They build this design of pump direct connected by flexible coupling to electric motor, for handling either sewage or any drips which come to these low places. The equipment consists of a specially de-



New Valve and Bibb Seat Dresser.

signed centrifugal pump; a vertical motor being direct connected by flexible coupling; a float; a float switch; and where necessary an automatic starter. The cast iron floor plate is made of such diameter as to cover either a cement catch-basin or a cast iron tank.

The apparatus is built for direct and alternating current, and makes an exceedingly nice and convenient equipment.



New Vertical Sump Pump.

Analysis of Can. Sanitary Engineering By-laws

Commenting Upon the By-law Known as By-law No. 528, Governing Sanitary Engineers and Sanitary Engineering Construction in the Town of Waterloo, Ontario.

THESE comments have become so interesting to our readers that we have decided to continue the series by taking up the by-law now in operation in the town of Waterloo, Ontario. The reason we have chosen this particular one is, that Waterloo is not quite as large a place as those whose by-laws we have taken up previously, and notwithstanding the fact we must say that, Waterloo must be credited with having a fairly up-to-date by-law. Not only does it deal with the construction of sanitary engineering, but also with the licensing of sanitary engineers, and who shall be granted licenses. Which is not the case with most Canadian towns and cities.

This by-law is divided into several parts, and deals with various subjects under respective headings in the following order:

- Part 1.—Licenses.
- Part 2.—Inspectors.
- Drainage.
- Plans and specifications.
- Material and workmanship.
- Soil pipes, waste pipes, etc.
- Traps and vents.
- Water closets.
- Bath tubs, sinks, wash basins, etc.
- Rain water leaders.
- Connecting old work.
- Penalties.

We will reprint the by-law, clause by clause.

By-law No. 528.

To license and regulate plumbers, to regulate plumbing and to secure the sanitary conditions of buildings.

The Municipal Council of the Corporation of the Town of Waterloo, enacts as follows:—

Part 1.—Licenses.

Clause 1.—Every person or firm desiring to carry on the business of a plumber within the limits of the Town of Waterloo, shall take out a license, for which such person, or firm, shall pay the sum of five dollars (\$5.00).

This clause is of a very general nature and needs very little commenting upon, except that a license in our opinion is not enough. There should also be a bond demanded from every person or firm applying for such authority. Up to the present time the granting of licenses has been a minor matter. Yet

in actual fact it is one of the most important undertakings that a person can engage in, and one which requires more than ordinary skill, if carried out properly and in a creditable manner by all concerned. It is a very easy matter to construct work according to various by-laws, and to pass the necessary tests, but actual wear and tear is something which requires time to prove that work has been properly constructed. Further, as a town or city grows, work is done which is not brought before the notice of the authorities, and often proves to be of a very poor class. We would strongly recommend that a bond be put up by every applicant, as a guarantee of good faith that the public may be safeguarded in every way against the construction of poor work or material.

Clause 2.—No license shall be granted for a longer period than a calendar year, or the unexpired portion thereof, and no license shall be transferable.

This clause shows that a license is valid only till the last day of December of each year, irrespective of what day or month it is granted, and every license must be renewed on the first day of January of each year.

Clause 3.—Every person or firm desiring such license, shall file with the inspector an application in writing, giving the name, in case of a firm, of each member thereof, together with the place of business.

This clause is one which is very often omitted in our by-laws, and is to be commended, particularly in small towns where a board of examiners would be difficult to get. In such a case, the inspector should be a man of at least 10 years practical experience, and be in sympathy with the cause of sanitation. A man of specially good character, who could be trusted to use good sound judgment, when passing upon the qualifications of an applicant for a license.

Clause 4.—Every applicant shall be of the full age of twenty-one years, and shall furnish the inspector with satisfactory evidence of his qualifications and responsibility, or that he will employ qualified plumbers to do all plumbing work which he may engage to do, and will not permit any work to be done for him except by such qualified plumbers.

While this clause is general, there is no means of proving that an employee is competent until some work has been installed, further these licenses are apparently only for persons or firms engaging in the business of plumbing. There should also be licenses granted to journeymen and improvers. It is not enough that employers only be licensed, for instance, suppose a journeyman be temporarily out of employment, and he is asked to execute a small job for some one, he would be free to do that job. He should at least be registered, so that the health department of the town would know who and who are not doing work in that town. This is a source of trouble to the health departments in large cities, because often a journeyman will enter some city, and start up a jobbing workshop, whereas if the law required every journeyman to become registered and failing taking out registration a stiff fine be imposed, there would be less botch work done, than is at present.

Canada, being a young country, her towns soon grow to be large cities, and it is necessary to exercise great care in the development, and sanitary engineering work is of such a nature requiring the most stringent laws to govern it, therefore, we would recommend that every journeyman be either licensed or registered, before even engaging in the construction of sanitary engineering.

Clause 5.—Licenses shall be issued by the town clerk upon recommendation of the inspector.

Clause 6.—Any change in a firm or in the location of a licensee's business must be promptly reported to the inspector, and the license shall be posted up in a conspicuous place at the licensee's place of business.

Clause 7.—In case any licensee, or any of his employees, shall be guilty of any violation of the provisions of this by-law, or of any of the rules and regulations prescribed by this council, the inspector may declare forfeited the license of such licensee.

Clauses 5, 6 and 7 are all embodied in almost every by-law, and do not in any way interest the mechanic any more than being mere legal instructions. We will not comment upon them.

(Continued in next issue.)

Clean Up Your Shop and Take Stock

System in the Stock Room as Essential as a Bookkeeping System—Every Fitting Should Have a Place—A Well Kept Stock Book as Necessary as a Well Balanced Bank Book, and Can Easily Be Kept in Order Once Put in Order.

If the bank clerk were to enter every set of figures in one's bank book, starting at the left hand top line, and fill in each set after one another to read on, just as we read ordinary printing, what a jumble of figures there would be. Suppose the book were never balanced, we should never know what balance stood to our credit. We should never know whether we were in debt, or how rich we were.

That is exactly the case with an untidy stock room, a stock room without system. During the last two years or so the writer has visited scores of shops, some with separate stock rooms, and some, where the workshop was a mixture of stock room, office and workshop. Many of the former were fairly tidy but not a few were much the reverse, thus

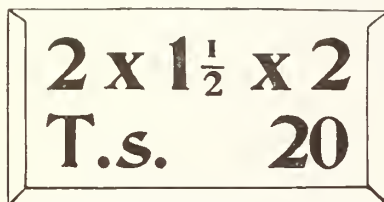


Fig. 1.

resembling the bank book above mentioned.

If there is one thing more essential than a balanced bank book, which will show a sanitary and heating engineer the state of his wealth, it is a well-kept systematic stock room. Workmen will appreciate it, and it gives them an idea that the boss is looking after things. A Fitting means cents. "Fittings" means

dollars, and to see the way they are thrown about is nothing less than a scandal.

At the present time there is very little business, except such as can be created

of 2 1/4 millions of dollars. But before trying to create new business, clean up shop and take stock. Find out whether your stock is in shape, determine whether your bank account or your stock



Fig. 4.

by getting after it, and of that kind there's plenty. We have shown on another page how there is actually an increase over September 1913 in the building permits granted to the extent

amount will bear the burden of extra business. It is no use asking the banker to finance your business if you are carrying a lot of dead stock. Now to illustrate our argument a little, we will re-

3/4" x 1/2"	3/4" x 1/2"	3/4" x 1/2"	3/4" x 1/2"	1/2" x 1/2"	1/2" x 1/2"	1/2" x 1/2"
1/4" x 1/2"	1/4" x 1/2"	1/4" x 1/2"	1/4" x 1/2"	1/4" x 1/2"	1/4" x 1/2"	1/4" x 1/2"
1/4" x 1/2"	1/4" x 1/2"	1/4" x 1/2"	1/4" x 1/2"	1/4" x 1/2"	1/4" x 1/2"	1/4" x 1/2"
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4 1/2" x 1/2"	4 1/2" x 1/2"	4 1/2" x 1/2"	4 1/2" x 1/2"	4 1/2" x 1/2"	4 1/2" x 1/2"	4 1/2" x 1/2"

Fig. 2.

late an incident which actually happened.

Not very long ago a man was employed to clean up the stock room of a very large sanitary and heating engineer. He became so interested in his job, that he began making a place for every fitting, and finally got every fitting in its place, and what was the result? No less than three barrels full

These tees were finally shipped back to the factory with the exception of a few dozen. Another instance which caused a little puzzle to one firm was this. A very energetic shopman, came to the conclusion that there were too many butt ends of pipe coming back from jobs without any thread on. This meant a dead loss. When a length of pipe leaves the shop it has two threads on,

left the customer would pay for every thread he got, and the boss would not be the loser. However, this particular man had a rule put into force that no pipe should come back with less than one thread at least. The result was many nipples were made by the apprentices, and soon several hundred dollars' worth of nipples were in stock that were not accounted for by purchases. The boss was clearly so much to the good, and by starting this system, that particular shop is now making money. Every fitting in and out is accounted for. If the shop makes nipples on spare time, the shop is credited with their invoice value with freight added, and in that way it has been proved that a shop can be made to pay its own overhead charges. Not by making nipples alone, remember, but by eliminating every other source of loss which frequently occurs in a poorly kept shop. The first thing that is necessary in a stock room is lots of bins in which to store fittings. The next is a label on each bin. Then a plan of each set of bins is necessary, so that any ordinary workman can step in and find any fitting he requires, because if there is a store-keeper and he is sick, or absent for some other reason, the stock is sick too, simply because no one can find what is wanted. Then there are cases where a shop will not stand the expense of a man always on the job, and the supply of fittings is apt to run out. Such a condition of affairs is exactly the same as a man making out a cheque, not knowing exactly how his account with the bank stands, and receiving word that his cheque has been returned marked on the back, N. S. F., not sufficient funds. Many hours have been wasted for the sake of a few fittings, and in many cases there was actually any amount of fittings in stock which could not be found, exactly the same as

(Continued on page 29.)



Fig. 5.

of $1\frac{1}{2}$ and $1\frac{1}{4}$ tees were collected. Now it would be very interesting to know what in the name of "Sam Hill" any ordinary shop would want with such a quantity of straight tees of any size.

for which the boss pays. When it is returned with no thread on, the customer has got the threads and the boss has paid for them. Now, if every time a cut is made a thread were put on the piece

$3/4 \times 1/2 T_2$	$3/4 \times 1/2 T_1$	$3/4 \times 3/8 T_1$	$3/4 \times 3/8 T_2$	$1/2 \text{ in } T_1 \times 1$		$1/2 \times 3/8 T_2$
$1/2 T_1 \times 2$	$1/2 \times 1 T_2$	$1/2 \times 3/4 T_1$	$1/2 \times 1/2 T_1$			$1 \times 1/2 T_2$
	$1/2 \times 1 1/2 T_2$	$1/2 \times 1 T_2$	$1/2 \times 3/4 T_2$	$1/2 \times 1/2 T_2$	$3/4 \times 1/2 T_2$	$3/4 \times 1/2 T_2$
$2 \times 1/2 T_2$	$2 \times 1/2 T_2$		$2 \times 1/2 T_2$	$2 \times 1/2 T_2$	$2 \times 1/2 T_2$	$2 \times 1/2 T_2$
$2 1/2 \times 1/2 T_2$	$2 1/2 \times 2 T_2$	$2 1/2 \times 1 1/2 T_2$	$2 1/2 \times 1 1/2 T_2$	$2 1/2 \times 1 T_2$		$2 1/2 \times 1/2 T_2$
$3 \times 1/2 T_2$	$3 \times 2 1/2 T_2$	$3 \times 2 T_2$	$3 \times 1 1/2 T_2$	$3 \times 1 1/2 T_2$	$3 \times 1 T_2$	$3 \times 3/4 T_2$
$3 1/2 \times 1/2 T_2$	$3 1/2 \times 5 T_2$	$3 1/2 \times 2 1/2 T_2$	$3 1/2 \times 2 T_2$	$3 1/2 \times 1 1/2 T_2$	$3 1/2 \times 1 1/2 T_2$	$3 1/2 \times 1 T_2$
$4 \times 1/2 T_2$	$4 \times 3 1/2 T_2$	$4 \times 3 T_2$	$4 \times 2 1/2 T_2$	$4 \times 2 T_2$	$4 \times 1 1/2 T_2$	$4 \times 1 T_2$

Fig. 3.

"Shop Economics"—A Talk With Boss, Journeyman and Helper

Showing Where Savings Could be Made, Where the Boss Would Save, Journeyman Earn, and Helper Learn, by Adopting the Right Method at the Right Time.

DO sanitary and heating engineers devote enough time and care when making purchases? is a question which, though not often asked, was however asked of the writer the other day. The reason this question was asked at this particular time was: A gentleman gave a contract for a whole outfit of sanitary and heating engineering for his residence to a certain sanitary engineer. When the contract was about finished, it was found that several pieces of brass goods were of a very inferior quality, while the balance of them and the greater part of the fixtures were such as would allow of a first-class brand of brass goods. The gentleman pointed this fact out, and was told that he, the sanitary engineer, hadn't taken very much notice of the style or quality of the goods. Says he: Oh well, a 1/2-inch compression basin cock is the same the world over, but a poor one is apt to creep in now and again. Again the customer asked: Well, do you not buy certain manufacturers' goods which you have learned to know, or how do you judge whose, in your opinion, are the best? The same reply was vouchered, that all brass goods were simply brass goods, and there was the end to it.

Now, readers, we do not for one moment think that this sanitary engineer could be taken as an average, but we do know that when a sanitary and heating engineer opens his order book and is ordering for stock, he as often as not begins something like this:

2 doz. 1/2 in. P. B. for iron pipe.
2 doz. 1/2 in. H. B. for iron pipe.
2 doz. 1/2 in. N. P. comp. basin cocks.
H.
2 doz. 1/2 in. N. P. comp. basin cocks.
C.

25 lengths of 4-in. soil pipe, S. H.
25 lengths of 4 x 1/4 S. P. bends.
and so on to the end of the order. He may state the price he expects to pay, but very seldom does he specify the make he wants. Of course, if he is buying from a manufacturer direct, that may alter the case, but there is as much bought from other sources as there is direct, if not more. Again, the price is too much of a feature with the sanitary and heating engineer, which should not be the case. Quality should be the dominant feature every time. The reason sanitary and heating engineers are looked upon by the public with a cer-

tain air of suspicion is because the public are becoming more enlightened every day, and consequently require to see and know more of our business. Not very long ago the writer was asked if it was always necessary to have a roughness and sharp points around the bath taps where they were screwed together; and when questioned why such a thing was asked, was told that he, the questioner, had had new taps put all through his house, and the plumber told him that it was not actually necessary, but that it was impossible to install them with anything but a Stillson wrench, and the wrench cut the edges of the nuts, etc.

Such an answer was utterly absurd, and the public are beginning to see it. Then again, the public to-day are more ready to listen to the sanitary engineer, and if he can show why a higher priced piece of goods is better worth the extra cost than a lower priced piece of poorer quality, they will take the higher priced article. But for the sanitary engineer to explain the why's and wherefore's, he must know the goods he buys, he must know the class of material they are made of, and the manufacturer of the goods, too. Let us just imagine that a bill of goods and labor necessary to fit up a residence amounts to \$300. The material being the cheapest money can buy and the job having been peddled round, so that the profit is an uncertain amount. Then let us imagine that the owner, after getting the \$300 price quoted, turns around and says: "Well, now, Mr. Sanitary Engineer, I'm told that this is a very low price, and I've decided to put you on your honor and give you \$45 more, on condition that you will apply nothing less than \$25 on to the price, or shall we say, the value of the brass goods." Meaning that a better quality be supplied than you at first intended to install. Will there be any comparison between the goods you intended supplying and those you can now supply for the extra \$25? That \$25 extra will mean that you will now be ready to stake your life almost on the quality, whereas the cheaper line would have looked like two cents. Here is the answer. The very fact that a better and higher grade of goods is required makes it necessary for you to know something about the goods. Next you will find that the better grade of goods, as a general rule, requires less

labor to install, and will stand up better when being subjected to the various tests they are subjected to before the job is turned over to the owner. Last but not by any means least, you will be better pleased with the work yourself, and the job will, without doubt, reflect great credit upon you. This being the case, why not learn all we can as sanitary and heating engineers, about the goods we buy. Show our customers or prospective customers how they can save more by buying higher-grade goods, goods with a reputation behind them. Reason the matter out with your customer, that buying high-grade goods is simply investing capital which will be invested well, and not, as is the case when spending money on cheap lines.

High-grade goods are always cheap and good at the price. But low-priced goods are, in 99 cases of out of 100, **good and cheap**, though expensive at any price. Therefore to know more of the goods we buy and the labor we engage, will bring better results to sanitary and heating engineers than anything else we can think of. Buy the Highest grade of goods only, and make a reputation for yourself by so doing.

HINTS FOR THE TIN SHOP.

A SOLDERING flux that can be used for tinning surfaces of metal without any previous cleaning is made as follows:—Dissolve 1 lb. of zinc in muriatic acid and add 22 ounces of sal ammoniac to the solution, which is then allowed to evaporate and crystallize. The yield is about 2 1/4 lbs. The salt is moistened and brushed on the metal to be soldered or tinned. The solder will readily flow wherever the flux has been applied. Muriatic of zinc is made by feeding into muriatic acid small pieces of zinc until the mixture ceases to boil. Dilute with an equal portion of rain or distilled water. To prepare borax for brazing, roast the borax until all of the moisture is driven off. Pulverize and mix it with the distilled water until it becomes a thin paste. A recipe for tinning copper and brass is as follows: Boil 3 lbs. of cream of tartar, 4 lbs. of granulated tin or tin shavings and 2 gals. of water. After boiling for a sufficient time, place the articles to be tinned in the mixture and continue boiling until the tin is precipitated upon the object.

Practical Course for Sheet Metal Workers.

Article No. 4 of Series

By CHARLES SEIVERS

To Bisect a Line.

Fig. 1. To bisect a given straight line. Let A-B be the given straight line, with A as a centre and using as a radius any distance greater than half the length of A-B, as A-F. Strike an arc as C-F-D. With B as a centre and using the same radius strike another arc, cutting the first one at C and D. Draw a line joining C and D. This line will bisect the line A-B at E.

To Bisect An Arc.

Fig. 2. To bisect a given arc. Let A-B be the given arc. With A as a centre and using as a radius any greater than one-half the distance A-B, strike an arc, with B as a centre and using the same radius strike another arc, cutting the first one at C and D. Draw a line joining C and D. This line will bisect the arc at E.

To Erect a Perpendicular To a Given Line.

Fig. 3. To erect a perpendicular to a given line, at one of its ends. Let A-B be the given straight line, it is required to erect the perpendicular to it at A. Select a point, as C. With C as a centre and C-A as a radius, strike an arc cutting the given line at D. From D draw a line through the point C cutting the arc at E. Then draw a line joining A and E. This line A-E is the perpendicular line required. Fig. 4. To erect a perpendicular to a given straight line from a given point within it. In Fig. 4 we show two methods of erecting the required line. In the first method let A-B be the given straight line, and C the point within it. With C as a centre and using any convenient radius, strike an arc as D-H. With D as a centre and D-C as a radius, then strike an arc cutting through the first one at E with E as a centre, and using the same radius, draw an arc as F-H cutting the first arc at H. With H as a centre and using the same radius, draw an arc to cut the last one at L. Draw a line joining L-C. The line L-C is the required perpendicular.

In the second method, shown in Fig. 4, let A-B be the given straight line and C the given point within it. With C as a centre and using any convenient radius, draw a semicircle cutting A-B at D and E. Using D and E as centres and D-E as a radius draw two arcs, cutting each other at F. Then draw a line joining C-F. The line C-F is the required perpendicular.

Fig. 5. To erect a perpendicular to a given line from a given point lying away from it.

In Fig. 5 two methods are shown. In the first one, let A-B be the given straight line, and P the given point. With P as a centre, draw an arc cutting the line A-B, as at C-D. With C and D as centres, and using any convenient radius greater than one-half the distance C-D, draw two arcs cutting each other as at E, and draw a line from E to P. The line P-E is the required perpendicular.

In the second method shown, let A-B be the given line, and P the given point away from it. On the line A-B take any two points as C and D, with C as a centre and C-P as a radius, draw an arc as X-X-X. With D as a centre and D-P as a radius draw an arc as O-O-O, cutting the first arc at P and E. Draw a line joining P and E. The line P-E is the required perpendicular.

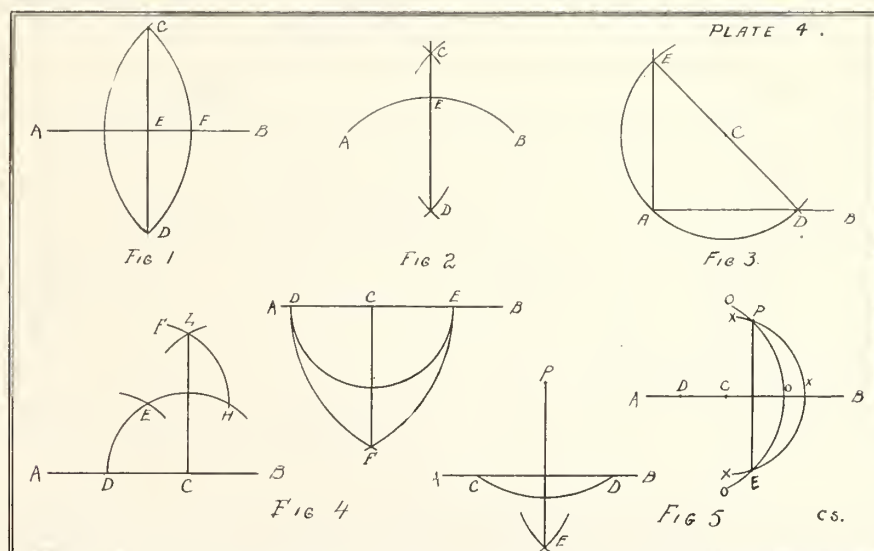
THE FUNDAMENTAL REASON.

A sudden, nervous shock can stop the human heart as by a hammer blow, but unless the result is fatal, which is rare, the organ quickly resumes its vital function, and the tide of life, slowly gaining strength, flows on again, every unit in complete restoration. This fact, because of its logical implications, is of special significance at this time. Another fact of at least equal significance is that:

The moment of shock is the moment of greatest danger.

Which is true, whether we speak of the heart of an individual or of a nation. The moment of greatest danger to a nation is the moment of panic. This being past, every factor works automatically for complete restoration. Millions of people who, in enforced idleness, do no more than consume the mere necessities, work nevertheless automatically for the resumption of normal activities and their own re-employment. Their demand, though lessened, is continuous, and steadily accelerates the flow of national life through all the channels of commerce and industry until the current is at full tide again.

The normal condition of life is prosperity, which is nothing but a name for the normal state of things, in which every worker is producing and the products of industry are being freely exchanged in accordance with the law of supply and demand. The operation of this law is incessant and universal. In spite of artificial restraints and of extraordinary and violent interruptions and derangements like the general European war, it continues persistently, and steadily tends to restore itself, because its operation is based upon the simple but indestructible fact of human existence. As long as human beings live they will produce and progress. This is the peculiar distinction of the human animal, and from this fact alone, prosperity, as the normal condition of the race, is another fact.



In developing the above problems we suggest that the student make his drawings four times the size of the above sketch.

The Method and Manner of Laying-Out Plates*

The Laying-out of Plates to Form the Various Shapes for Which Sheet Metal Parts Are Used Involves Difficulties That Are Only Discovered When Such a Job is Undertaken—System and Intelligent Application Are Therefore of the Greatest Importance in Procuring Successful Results.

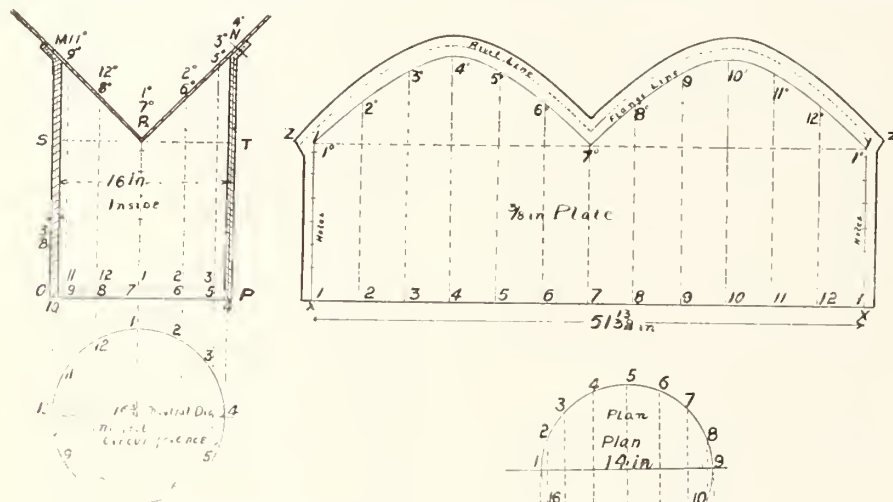
By Joseph W. Ross.

WHERE cylindrical work is to be fitted to an angular or irregular surface, the shaping of the sheet so as to roll up to the required angle requires that a development of the angular edge be made. This develop-

tion of a cylinder cut at an angle of about 30°. In developing this, it is necessary to draw it out full size on a spare piece of plate, but for home study it may be reduced to a smaller scale, according to the wishes of the student.

The figure A C D E B represents the elevation view. Above this, describe a circle to represent the plan, and divide the circle into a number of equal parts as deemed necessary. In this case, 16 parts have been chosen. Number each part from 1 to 16 in their consecutive order. Greater accuracy can be obtained in the development by the use of a larger number of divisions.

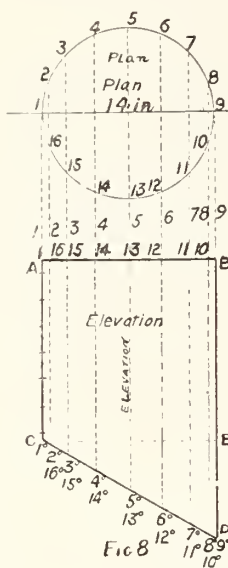
From each divisional point in the plan Fig. 8, draw to A C and B E D, lines parallel to the intersection of the inclined line C D as shown in the elevation, Fig. 8. It will be observed that if the line circle of the plan be straightened out, the divisional points maintaining their equally spaced positions, that the straightened line or the stretch-out of the circle will be equal to the circumference of the circle divided into 16 equal parts. Each division will represent the starting point of one of the parallel lines, which cut the angular part of the elevation. The diameter of the circle is 14 in. Its circumference or



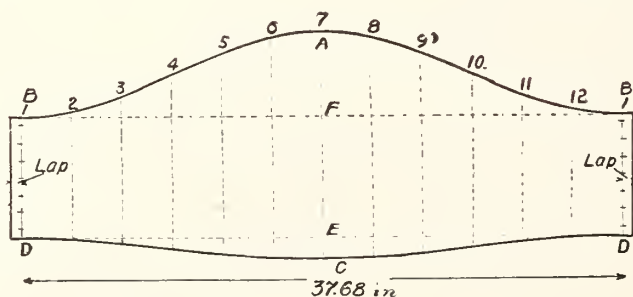
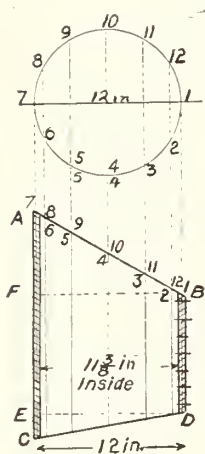
Figs. 10 and 11.

ment is simply the stretch-out of the angular surface. The development of a plain cylinder would be a rectangle and that of a beveled cylinder would be a rectangle with one curved edge, as will be seen.

In Fig. 8 is seen the plan and eleva-



Figs. 8 and 9.



Figs. 12 and 13.

Figs. 8 and 9.—Elevation and development of cylinder with one bevelled end. Figs. 10 and 11.—Plane and elevation of V-Shute connection for bin and its development. Fig. 12 and 13.—Plane and elevation of cylinder with two beveled ends.

stretch-out is, therefore, by the decimal formula, 3.1416×14 which is 43.98 in. By the fractional formula, $14 \times 31-7$ equals 44 in., which is quite near enough for practical purposes.

Measure off on the required plate, a stretch-out of 44 inches. As the part A B C E, Fig. 8, constitutes a right cylinder (one that is square at both ends), it will require a rectangular section of plate; therefore, bisect the line A B A on the development, Fig. 9, and square

*While this article is written more for boiler shop practice, the steps in developing the patterns are identically the same as would be followed in sheet metal or tinsmith practice, except that a greater allowance is made in material to allow for thickness in metal and rivet caps.—Editor.

up the plate, using the height A C or B E. It will now appear, after squaring up, as the rectangle A B A and C.E.C. Divide the lines A B A into 16 equal parts and with the dividers in conjunction with the lath, transfer all these points to the line C E C. Connect these points by lines parallel to lines A C and B D. Number all lines as shown in Fig. 9, obtaining the numbers from the plan view in Fig. 8, and allow all the parallel lines to project below the line C E C.

From line A B, Fig. 8, measure with the trams, the length of line 1.1° and transfer this length to 1.1° on the development Fig. 9. Measuring from line A B again, reset the trams to distance, 2.2°, Fig. 8. Mark this off on corresponding number in the Fig. 9, and reset the trams to distances 3.3°, Fig. 8, and so on until all the lengths of parallel lines in the elevation view, Fig. 8, are transferred to corresponding numbers on the development Fig. 9. Measure in each case from A B, Fig. 8, and transfer the measurement to the plate, working every time from the line A B A. Connect all the points thus located with an even curve, as shown by the curved line C C. Mark off the rivet holes and add the required laps.

In Fig. 10 is shown a cylindrical chute of $\frac{3}{8}$ -in. plate fitted to the bottom of an angular bin. Divide the neutral circumference view into 12 equal parts, and from these points of division extend parallel lines to the angle of the bin M R N. Number each line as shown in Fig. 10. Now calculate the stretch-out of the plate. The neutral diameter is, therefore, $16 + \frac{3}{8} = 16\frac{3}{8}$ ins. The neutral circumference or stretchout equals $16\frac{3}{8} \times 3.1416$, which is 51.4, or 51 13-32 ins.

Measure off a distance equal to 51.4 inches; bisect the line and square up with a height equal to S O or T P. This gives the development of the right cylinder S O P T. To this must be added the sections M S R and R N T, the development of which will now be explained. Divide the line XX into 12 equal parts in accordance with the divisions in Fig. 10. Transfer these points from XX to YY and connect by lines parallel to XY, XY, prolonging these lines some distance past the line YY. Number each line in manner similar to Fig. 10.

Set the trams to distance 1.1° of Fig. 10, and transfer this length to line 1.1° in Fig. 11. Reset the trams to distance 2.2° and transfer this distance to 2.2° in Fig. 11. Continue this process with each point of identification until all have been transferred to Fig. 11. Connect all the located points with an evenly drawn curve. Mark off from lines XY, XY, $1\frac{1}{2}$ inches for laps, and divide the rivet line into the desired equal number of rivet spaces.

Measure from the developed curved

line a distance of 3 inches for the flange allowance and also space off the requisite number of rivet holes on the rivet line of the flange. These holes may be punched in the templet, and after rolling fitted into place so that the holes may be marked off on the angular bin which is afterwards drilled. If the holes are already in place in the plates of the bin, they may be omitted in the templet until after being rolled and fitted into position, being then marked off on the templet and drilled or punched, according to conditions and facilities. An addition is required at the points ZZ to counteract the drawing in of the metal during the operation of flanging. In general practice it is advisable to allow plenty of metal. If too much is allowed, it is easily removed after flanging and good work is assured.

The completed templet is shown in Fig. 11. It is also necessary to note that one of the points, Z (the one on the inner lap), is thinned out or scarfed to permit the plates to be closed up at the point of contact with the side of the angular bin. In Fig. 12 is shown a cylinder bevelled at each end. The pattern is seen in Fig. 13, which will readily be understood after following closely the foregoing examples.

The next article of this series will illustrate the principle of obtaining the developments of conical forms by radial lines. The method of obtaining the camber as in the telescopic system of plating used in smokestacks, blast pipes, water pipes, lines, etc., will be explained and illustrated.



CLEAN UP AND TAKE STOCK.

(Continued from page 25.)

if the bank clerk did not balance your bank book, before returning a cheque marked N. S. F. Again, as we said before, if there is no regular stock keeper and several fittings got low in quantity, some simple method should be adopted. Here is a system which the writer found to be excellent. See first of all that there is a bin or place for every fitting, and on the front of each bin place a small tin tag-holder, as shown in Fig. 1. Make a rule and post it up that a certain number is the lowest quantity which must be stocked, say, for instance, 10 is the number. Now, in comes Jones and wants 25 2 x $1\frac{1}{2}$ elbows. Here is what he sees on the tag or label: 2 x $1\frac{1}{2}$ elbows, 10. He finds after taking out 25 there are only 6 left. He turns the label round and it shows white, meaning that 2 x $1\frac{1}{2}$ elbows are low and must be ordered. The store-keeper or purchasing agent, buyer, or whoever is authorized to order goods, takes a trip round the stockroom every day and on seeing the

labels showing white, knows at once that 2 x $1\frac{1}{2}$ elbows are needed. This can be worked out to a nicety, and it would surprise even the owner of the smallest shop to find what a benefit can be derived from an orderly and well-kept stock room. Fig. 2 shows a suggestion for a set of bins, and Fig. 3 shows what is seen by the stock-keeper when there is need for a replenishing of stock. Figs. 4 and 5 show the stock-room shelving and bins now in use at the locomotive shops of the Michigan Central Railroad in St. Thomas, Ont.

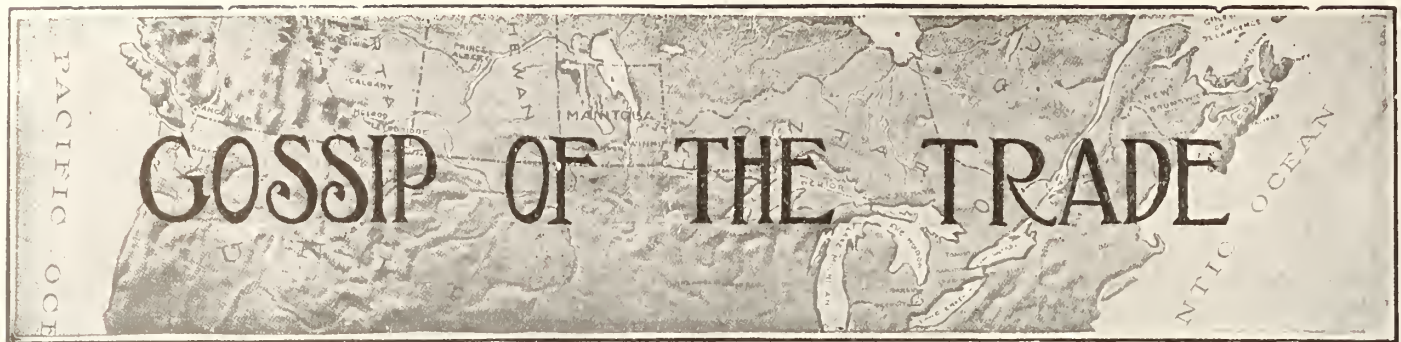
Another rule which would save a lot of time for sanitary and heating engineers is this. A man is at a certain job, and during the day he finds that he requires a few fittings or other material. Loss of time will be avoided if he started out with a good supply, and if each day at, say, 3.30 or 4 p.m., he were to make out a list and send an order down to the shop or phone it so as to be sure of getting the goods as early as possible to start with the following morning. The helper will not have to wait, thus keeping the man and often a team waiting while the order is being got ready. The writer has seen as many as 16 to 20 men waiting for material at a stock-room, and often losing not less than an hour a man. Which means, where an 8-hour day is in vogue, $12\frac{1}{2}$ per cent. of time is lost. No doubt a proper stock-room system would save more money for the sanitary and heating engineer than any other part of his business.

Another thing; suppose the sanitary and heating engineer is also a merchant, and a customer comes in and wants a few fittings, such a demand in most cases means cash, and being a staple line, it does not take many minutes of lost time to lose all the profit, besides giving the customer a bad impression of your business methods. Therefore clean up, take stock, and in that way determine just what you are worth. In that way find out whether your stock will take care and in actual fact, finance any new business you may be able to pick up, rather than go to the banker and pay a big interest. By having a clean, orderly and systematic stock-room you may be able to finance yourself by reducing your stock a little.

Will it soon be spelled Austria-Hungry?

There is something quite inspiring about the pessimism of some men; it shows how mean and foolish it is to be a pessimist.

The man who enlists is a patriot; but he isn't the only one. Those who stay at home and work to support the families are patriots, too.



Don't Drink Tap Water.

Ottawa school children have been warned by the local health department not to drink tap water. Arrangements are now being made to buy pure water from the Ottawa Dairy Co.

Sanitary Drinking Fountain.

A sanitary drinking fountain is being installed in the main corridor of the city hall, Ottawa, near the entrance, where the cooler of well water used to be. The fountain will be attached to the regular water service, and the water will bubble up high enough to be taken without the aid of cups.

Canadian Building Permits.

Despite the war and general business depression, we find that out of 26 of the largest towns and cities in Ontario, Quebec and the Maritime Provinces, there is an increase in the value of buildings for which permits were granted during the month of September, 1914, as against September 1913. It will be seen there is an increase of nearly 2¼ million dollars (\$2,221,440):

EASTERN CITIES.	Sept. 1914	Sept. 1913
Maritime Provinces.	\$	\$
Halifax	16,500	38,640
St. John	10,450	32,915
Sydney	1,550	14,100
Moncton	84,600	81,900
Quebec.		
Montreal	4,051,514	1,999,524
Maisonneuve	486,900	162,500
Quebec	125,544	290,858
Three Rivers	24,400	22,400
Ontario.		
Berlin	55,690	43,030
Brantford	13,322	92,550
Chatham	20,869	34,700
Guelph	25,620	21,500
Kingston	13,412	35,213
London	74,715	191,340
North Bay	1,800	18,325
Ottawa	1,251,550	190,700
Port Arthur	8,604	30,375
Owen Sound	16,000	11,600
St. Catharines	48,494	203,613
St. Thomas	11,400	23,026
Smith's Falls	8,500	40,825
Sudbury	8,800	143,335
Toronto	1,172,747	1,577,518
Welland	8,997	57,705
Stratford	36,290	13,240
Peterboro	12,160	22,186
Total, Sept. 1914	7,562,378	
Total Sept., 1913	5,340,938	
Increase, Sept., 1914	2,221,440	

To Form a Sanitary By-law.

It is very encouraging to note that quite a few of the small towns are forming sanitary by-laws. Port Colborne is

considering such a step and has appointed a committee to carry the project through.

THE PLUMBER.

By Walt. Mason.

With stately stride the plumber comes, and stays around a while and plumbs. He gives the boiler sundry slaps, and tinkers with the pipes and taps and when he leaves my humble place a smile of gladness lights my face. For he has made a modern shack of my abode, which, three weeks back, was such as people used to own along about the age of stone. For years I bought all kinds of pills to cure my relatives of ills. My old granny had the heaves, and swallowed tea of boneset leaves, year after year, and still felt punk, with daily spasms in her trunk. My aunt has foundered, and she knew green pains with every breath she drew, and though I bought her pails of dope the poor old girl was shorn of hope. My Uncle Hiram's rheumatiz just kept him muttering "Gee Whiz." And everyone around the shack had pink lumbago in the back. And then the Wise Man came along and said: "You'll ne'er be well and strong, you'll always have the grievous gripes, until you put in modern pipes." The plumber came, with lead and brass, and freed the place from sewer gas, and sprung some sanitation curves—and gets the praise that he deserves. Now granny has no fell disease; she's swinging on the high trapeze; my aunt can take a fall from Gotch in seven minutes by my watch; my Uncle Hiram, rid of aches, can whip Jack Johnson in three shakes.

To Treat Their Water.

Aylmer, Que., is to treat its water supply with hypochloride as a preventive measure against typhoid. The provincial health department have instructed this step to be taken. Several local medical men have suggested that 2,000 feet be added to the present intake pipe, of them asked him on one occasion.

HOME, SWEET HOME.

I've bought goods from Berlin, Vienna, New York.
Boston and Buffalo, then in Newark.
I've purchased in Paris, been also in Rome;
But say to you truly, there's no place like home.
Have been to Chicago, I'm sorry to say,
I got what I ordered, but first had to pay.
When the boxes were opened I stood there alone
And said to myself goods are better at home.
The stove that I sent for had only three legs,
What's the use of a stove if it hasn't it's pegs?
When I looked in the oven it was cracked to the dome
Then I wished to old Mike I had bought it at home.
I'm now all filled up with this buying away.
I'll buy where I sell my good butter and hay.
If the Lord will forgive me no more will I roam;
Hereafter I'll spend all my dollars at home.

Opportunity is the cream of time.

* * *

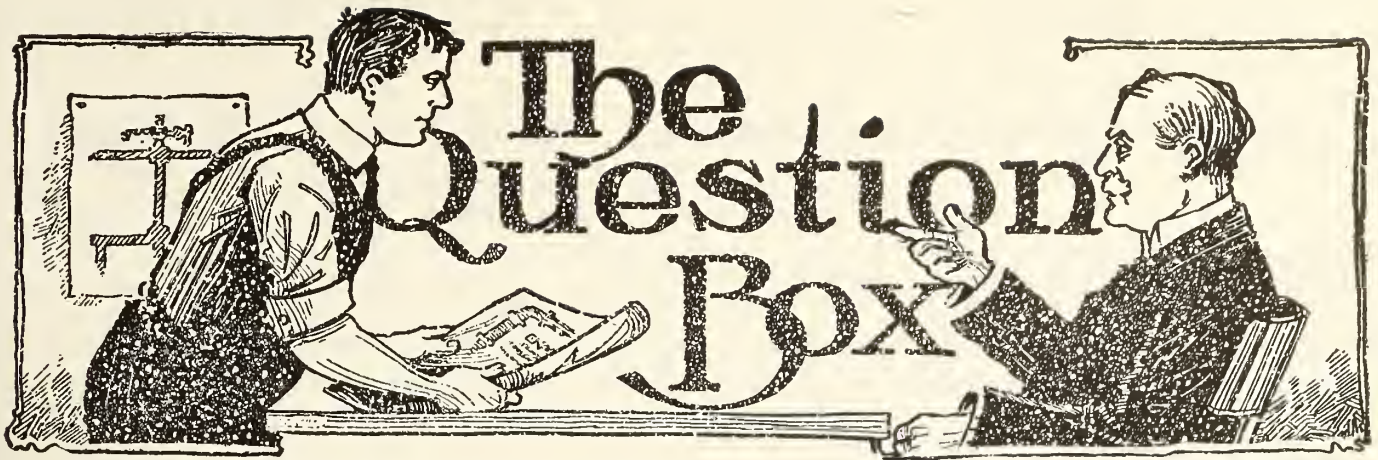
One sheep follows another—don't be a sheep.

* * *

The allies front extends 200 miles from the Somme to the Moselle—Somme front!

* * *

French soldiers are said to have deceived German airmen by making imitation guns of tree trunks. Their bark would be worse than their bite.



Subscribers Are Urged to Send in Questions to be Answered, or
to Comment on Letters Published—Description of Jobs Done or
Shop Kinks Are Also Invited.

Can Stacks Belonging to Warm Air Furnace be Used for Steam Heating?

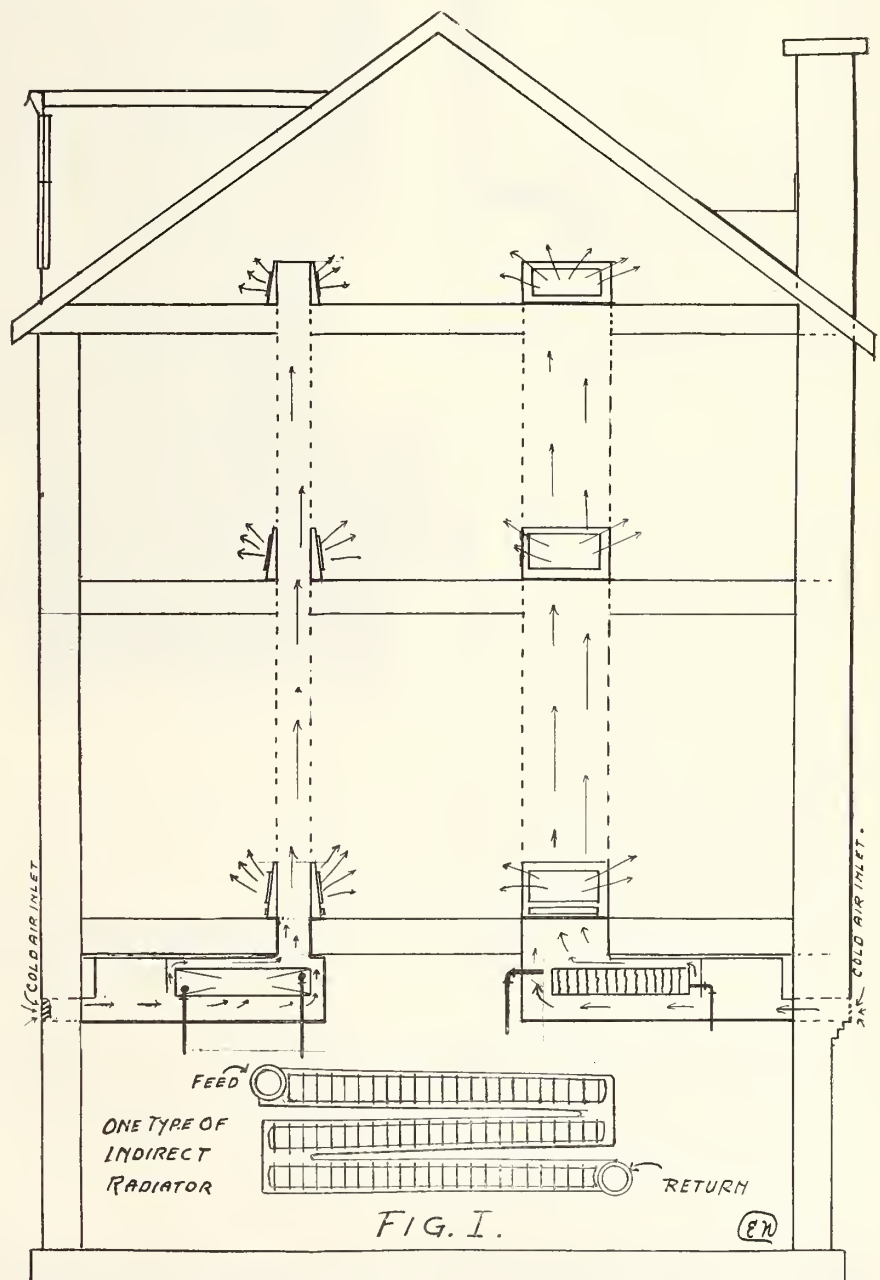
Editor The Sanitary Engineer:

I have been awarded a contract to take out a warm air furnace and install a low pressure steam job, and I would like to know if the stack pipe and registers could be used in any way. It is a fairly large house and there will be a lot of cutting and fitting around the baseboards where the registers have been placed, unless I can in some way use the stack pipes and registers.

A SUBSCRIBER.

Replying to subscriber, we may state that it is quite easy to use both the stack pipe and registers by installing a small indirect system of heating. If there is a register in each room of the house, it will not be necessary to place any radiators in the rooms. This indirect system may be installed in two ways, as shown in Figs. 1 and 2. Fig. 1 shows how the indirect radiators may be installed, placing one large radiator for each stack and fitting each with a separate cold air duct. Fig. 2 shows how one large radiator stack may be installed and several cold air ducts to supply air to it; then connecting each stack to the main box.

Neither of these systems would require a fan, providing there were some slight ventilation taken from the higher portion of the house, and in many houses this would not be necessary, because of their construction, which may allow sufficient leakage of air. Careful attention being given, such a heating system should be very desirable. There should be one or two evaporating pans placed in the radiator boxes to supply humidity.
—Editor.



TECHNICAL EDUCATION.

At this season, we begin to plan how we will spend our coming winter evenings, all kinds of classes for the industrial worker are being formed, and correspondence schools are busy working up

interested in his occupation to a greater extent that for the mere dollars and cents he receives."

No doubt this is true. If a sanitary and heating engineer is interested in his calling, he will never know too much about it. He will always be on the lookout for new books, new ideas and will no doubt own a fine set or two of books appertaining to his trade.

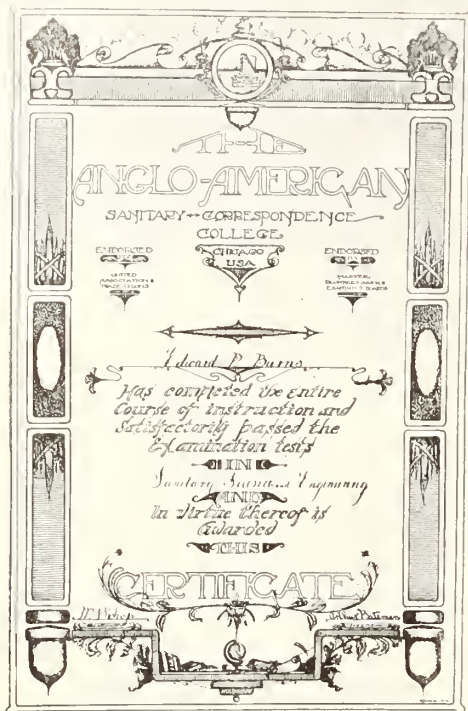
The International Correspondence School have recently issued a new plumbers' and steamfitters' pocket manual which should be in the possession of every employer as well as journeyman in the trade. It is an encyclopedia in itself, and is printed on fine paper, is a pocket sized book and profusely illustrated. More particulars referring to this manual may be had by writing to L. A. McConkey, Room 210 Kent Buildings, 156 Yonge street, Toronto.

Poor Pressure From Attic Tank.

Editor Sanitary Engineer.—Enclosed please find sketch showing water tank, pipes, bath, closet and lavatory. The water tank in attic is filled by an electric pump and frequently this supply tank is empty, and when refilled the water refuses to run into the bath, lavatory and closet flush tank. We believe that the supply pipes fill with air when the water is low in supply tank and when the tank refills the air remains in the supply pipes, thus blocking the pipes to the fixtures below, we would very much appreciate a suggestion from you that will help us to overcome this difficulty and prevent a recurrence of the same.

Supply tank is of eight-barrel capacity and often only half full, conse-

(Continued on page 34.)



Facsimile of certificate being issued to successful students of the Anglo-American Sanitary Correspondence College. In actual size it is 13½x20 inches.

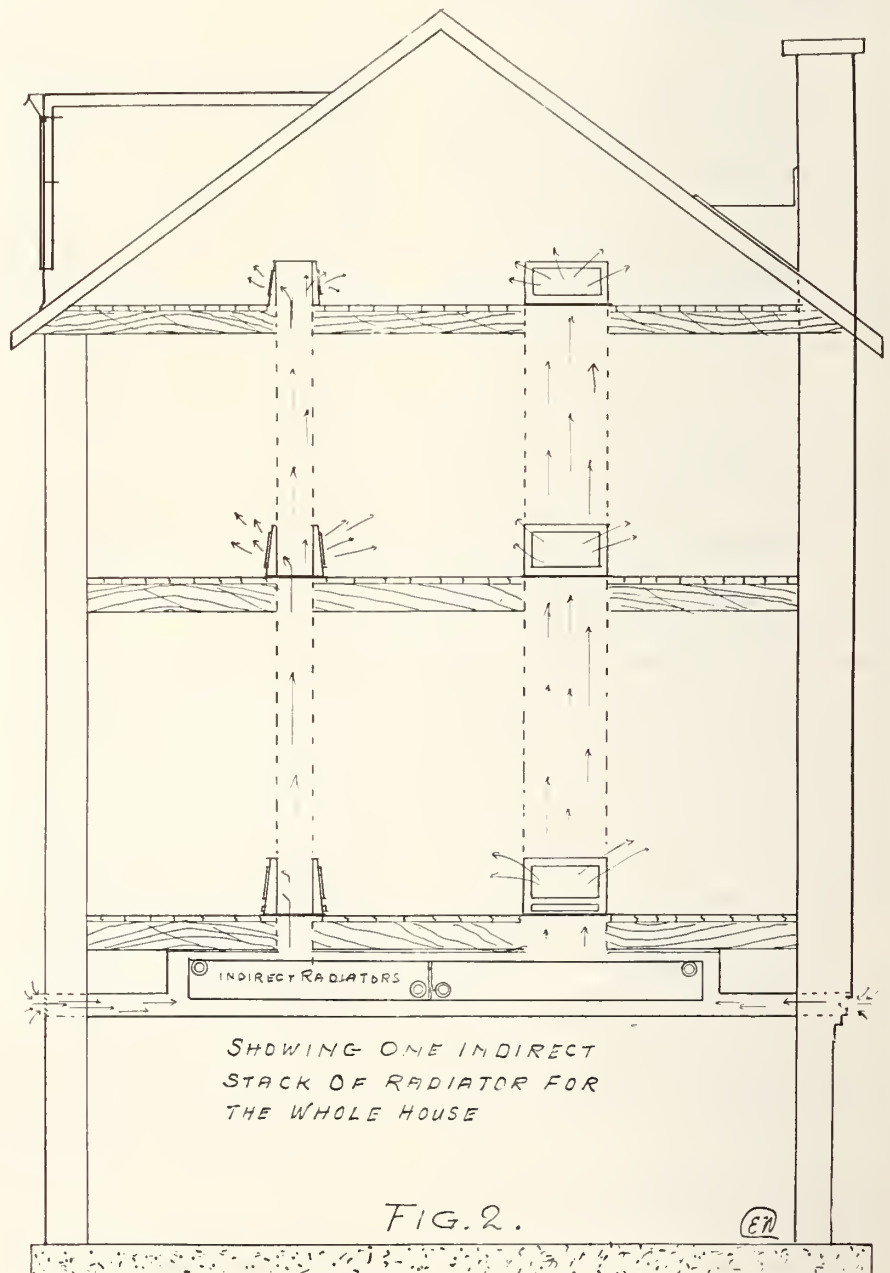
their campaigns to induce the worker to become more efficient in his calling.

To-day it is skill which counts. Skill is beginning to come into its own more than ever, and the man who knows and knows that he knows, will be able to command his full worth.

The employer is to-day beginning to realize that cheap labor is costly at any price, and that efficiency demands, and is worth a higher price. The Anglo-American Sanitary Correspondence College is issuing a very attractive certificate, a fac-simile of which we reproduce. This certificate is granted to all their students, who join their classes and devote the necessary time to study, which enables them to become efficient workmen, readers of the Sanitary Engineer should write for full particulars before they allot their spare time to less interesting, and in the end less lucrative pastime, to Professor Arthur Bateman, the Anglo-American Correspondence College, 10-12 Ontario street, Chicago.

New Sanitary and Heating Manual.

Some great man once said, "Show me a man's books, and I will give you his character. I will tell you whether he is a thinker. I will tell you if he is in-

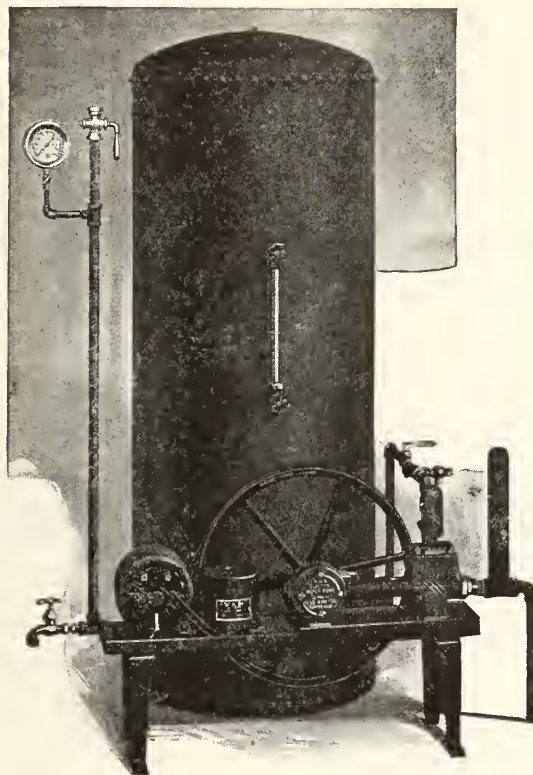


Have You Ever Looked to Your Surrounding Country Districts for Business?

Owing to the unfortunate war conditions in Europe the farmer is the most prosperous man in Canada to-day. He is getting more for his crops than he has for some previous years, and it is not only in your interest, but your duty, to see that this extra money going to him is kept in circulation.

Make him a visit to-day and show him the necessity of installing a complete water supply and sanitary system.

System No. B4, including tank, pressure gauge, water gauge, pump, electric motor and automatic switch, relief valve, $\frac{1}{2}$ -inch stop, $\frac{3}{4}$ -inch stop and waste, and $\frac{1}{2}$ -inch compression bibb tank, 30" x 6 feet



System No. B4

capacity — 220 gallons, vertical lift of pump 18 feet—will discharge to height of 75 feet and supply five ordinary house fixtures; pump automatically starts and stops by electric switch.

We have a large variety of outfits for every kind of domestic service, including hand, electric, water and power driven, deep and shallow well pumps. Write us for information and prices. We are sure that there is a large field for business open to you if you only go after it, and we wish to help and co-operate with you in every way possible.

Empire Manufacturing Co., Limited

LONDON, CANADA

MANUFACTURERS OF AND DEALERS IN
PLUMBERS' AND STEAMFITTERS' SUPPLIES OF ALL KINDS

Poor Pressure From Attic Tank.

(Continued from page 32.)

quently the water pressure is not sufficient to force the air out of the pipes.

A Regular Reader.

Replying to "A Regular Reader," we may state that the chief trouble is of course caused by the pipes being emptied of water and, on account of the air which accumulates in the pipes, then the pump being operated, filling the tank a little too suddenly. Of course by right, the supply pipe from the tank to the fixtures should come from the bottom of the tank instead of at the side. The horizontal pipe from the side causes the head of water to be less efficient than would be the case if the pipe were taken from the bottom of the tank. Our correspondent does not give us the height of the attic tank. Nor does he tell us whether there is a range boiler attached to the system. What is really wanted

and are the most economical appliance round a house.—Editor.

Is This In Accordance With Our Plumbing By-law?

Editor Sanitary Engineer.—I should like your opinion on the accompanying layout of a venting system on a basin; what I wish to know is whether it is in accordance with present day practice, or whether the basin trap vent should be connected with the crown of the trap? It seems to me that the accompanying layout is safe, as there is only a distance of 8½ inches between the crown of the trap and the brass waste and vent fitting.

I am also sending you an extract from our plumbing by-laws, which I would like very much, for you to analyze, pertaining to trap venting. What I wish to know is whether our by-law calls for any particular venting, crown or continuous venting.

separately and effectually trapped as near the fixture as possible, and never more than two feet therefrom.

Clause 34.

34.—Every trap, except on water closets, sinks and stationary wash tubs, must be vented, either by continuing the vent pipe as in section 31, or by a special vent pipe extending above the highest fixture on it; but in buildings of more than two stories every trap must be vented. The vents may be combined by branching together those that serve several traps. These vent pipes must always have a continuous slope to avoid collecting water by condensation. Where proper air ventilation cannot be obtained then water closet seats must be back vented but not into stack.

Clause 35.

35.—Water sealing traps of any pattern approved by the inspector may be used when separate air pipe connections are provided. On sinks and stationary wash tubs not vented, Ideal or other Deep Seal traps must be used.

Clause 36.

36.—No vent pipe shall be used as a waste or soil pipe.

Replying to C. J. H., we may say first, his sketch is quite in order. It is not, however, as universal a practice as it should be. Crown-venting should be discontinued by all means, and continuous venting made the rule where trap venting is the rule. We have expressed our views upon this matter very strongly and would like to see more towns and cities dispensing with too much unnecessary venting.

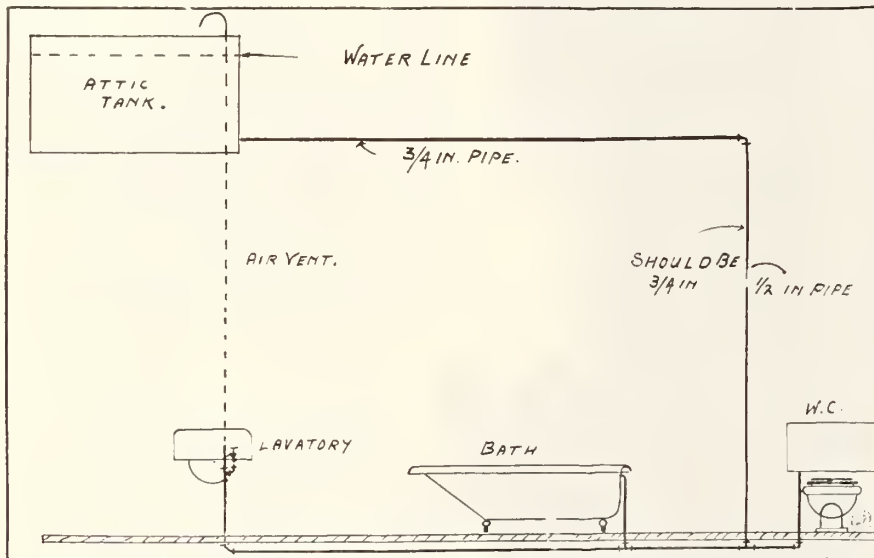
The by-law does not provide that any particular portion of the trap be vented. We find in clause 35 that there are certain fixtures which need not be vented. This is a very commendable clause. We must also commend C. J. H. for making the inquiry. It goes to show that he is not exactly satisfied with the poor method of crown venting.—Editor.

• • •

It's Foolish to Believe All Plumbers Tell Us.

Above is the title of a newspaper clipping which has been sent in by some person signing themselves "A Subscriber."

If our correspondent will furnish us with his name and address we will take this matter up fully, and answer not only the clipping, but also his letter.—Editor.



is an automatic switch, which will always keep a certain quantity of water in the tank, and while we have shown how the job can be remedied, we would rather advise him to pull out the horizontal pipe as well as the ½ in. vertical, and install a ¾ vertical from bottom of tank, or if the location of fixtures require a horizontal pipe enlarge the ½ in. vertical pipe and put in an air pipe as shown. We would strongly recommend that a pneumatic tank be placed in all such installations, they are more positive in action, and when our reader, or his customer has gone to the expense of an electric motor, the pneumatic tank would not be a great deal more costly, and would give every satisfaction. In case of fire, the attic tank is almost useless, whereas a pneumatic tank would be all that could be desired.

It is possible to throw water almost any height when a tank of this kind is installed. They require no attention,

Hoping you will take my subject up in one of your early issues of Sanitary Engineer.

C. J. H.

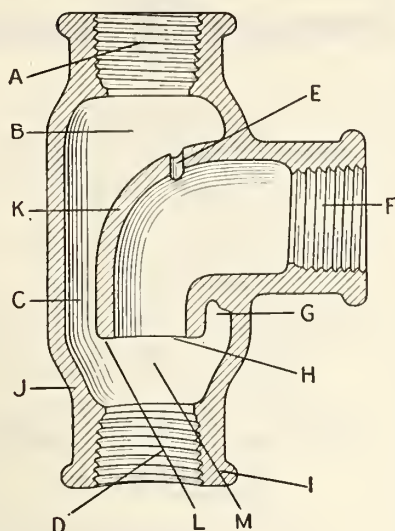
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Extracts From Our Plumbing By-laws. Vent Pipes.**Clause 31.**

31.—All vent pipes from fixtures shall be carried up through the roof, the same as soil pipe, the diameter to be not less than three inches where it passes through the roof. These vent pipes from different fixtures may be branched together and pass upward to roof, or may be connected with the main soil pipe, above the highest fixture.

Traps and Vents.**Clause 33.**

33.—Every water closet, urinal, basin, sink wash tray, bath tub, and every tub or set of tubs, must be



STACK NON BY-PASS TEE

Patented Canada and United States

A Cure for By-Passing Troubles in connection with domestic heating appliances.

Will absolutely prevent the flow of water through heater direct to faucet when the amount of water drawn is in excess of the capacity of the heater. All the water drawn at a faucet must come from the range boiler (except as mentioned), and thereby insuring a better service from the heating appliance.

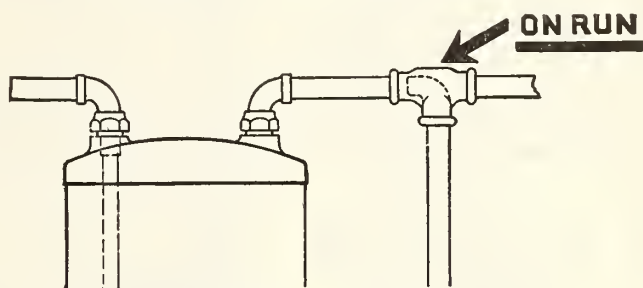
Equally adaptable for gas water heaters, water fronts, furnace coils, etc., and useful in many other ways.

We wish to cover this matter fully with you. Ask us for information.

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Manufacturers and Dealers in
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One method of using J.M.T. Stack "T"

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We are getting out a new illustrated price list and require the cuts. These price lists will be of interest to you. Write for one.

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JOHNSON IMPROVED DOUBLE CONE BIBB SEAT DRESSER

For Re-seating Bibbs, Basin
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4 Cutters with each Dresser
Best and Simplest Tool on the
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Finely Nickel Plated

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Ask your jobber or write us.

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upon business and investment values has been far-reaching. The business man and the investor has never been in greater need of accurate knowledge of conditions — and of the best possible business and financial counsel.

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through its unexcelled sources of information, and its exact analyses and forecasts, supplemented by its by-mail

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Annual Subscription \$3.00 the Year.
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THE FINANCIAL POST of CANADA

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TORONTO CANADA

The
Condensed Ad.
page
will interest you

John Wanamaker says that advertising doesn't jerk—it PULLS. He ought to know, and yet some men think that advertising should go against all rules and precedents and jerk them to success with one tremendous yank.

Needed Badly in many homes

The trap is a part of the closet bowl that cannot be cleaned except by Sani-Flush, and which, if allowed to remain in a dirty condition, will make the water standing in it foul and offensive. The ENTIRE closet bowl can be easily and thoroughly cleaned by sprinkling a little of Sani-Flush in the water which stands in the bowl—and by using a little of this white, odorless powder every day or two it will be kept perfectly clean.



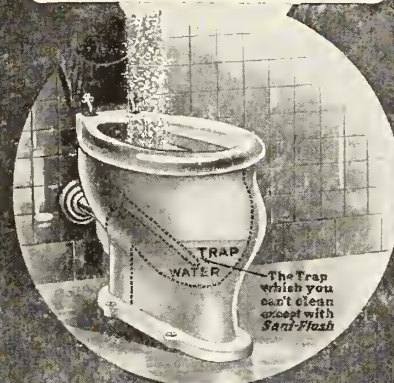
Sani-Flush

is perfectly safe to handle or use. It won't craze the porcelain bowl nor injure the metal pipes or fittings.

No scrubbing is necessary. Sani-Flush dissolves the incrustation in the trap, so that it washes out when the closet is flushed.

STOCK IT AND BOOST IT BECAUSE OF ITS GOOD PROFIT AND REPEATING QUALITIES.

Write for full particulars.



The Hygienic Products Co.

Dept. "S"

118 Eighth Street, S.E.

CANTON - - OHIO



"VULCAN"

Name your choice clearly

Your call in either way is sure to satisfy. Both tools, thoroughly tested before their sale, are bound to supply first-class results when in operation.

"Agrippa" Chain Tools, universally good for both pipe and fittings, have plainly indicated their worthy qualities in all kinds of work. Get one from your dealer and satisfy yourself of its Single-Jaw-worthiness—trial free!

Vulcans set the pace, kept up the pace and always will keep at the pace for all Chain Wrench work.

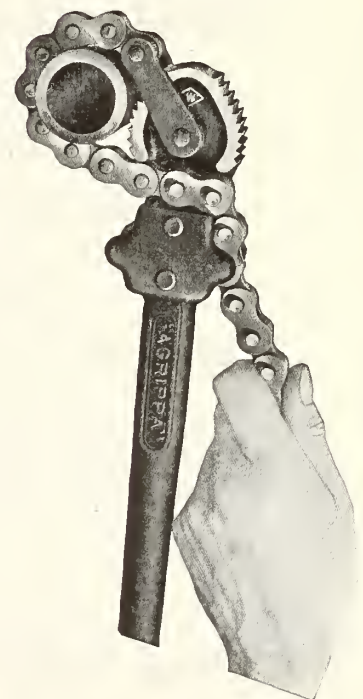
All Tools guaranteed. A choice is simply your declaration of different working-conditions for yourself. In either case perfectly safe and good.

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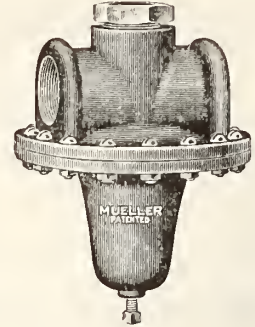
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The Mueller line is a varied one—it covers every phase of pressure regulation. You should acquaint yourself with this line. It is shown complete in our new catalogue No. 5. Clip and mail the coupon.

No. 13160



The best all-around regulator made. For hot water, cold water, steam, air, oil, etc.

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SARNIA, ONT.

Send me your No.
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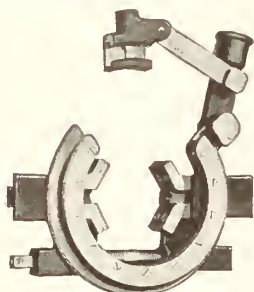
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As the cutting is done by means of a ratchet, pipes may be cut off in cramped places which would otherwise prohibit the use of an ordinary tool. One man can work the pipe cutter to advantage. This tool is capable of cutting off a 4-in. pipe in four minutes by a man using one hand only.

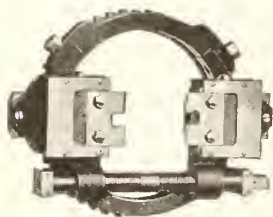
When the jaws are clamped to the pipe, they automatically center the cutting knives so that the pipe is cut off square. The cut is particularly clean, there being a conspicuous absence of burrs inside and outside. There is, further, little tendency to strain, distort or split the pipe, while the cutter can be quickly adjusted to fit any size from 2½ in. to 4 in. The tool will also cut through a thread as quickly and squarely as a piece of straight pipe.

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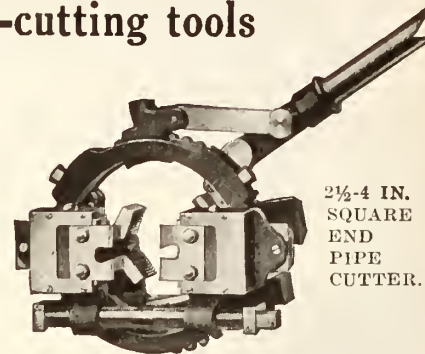
Write for full particulars and price.



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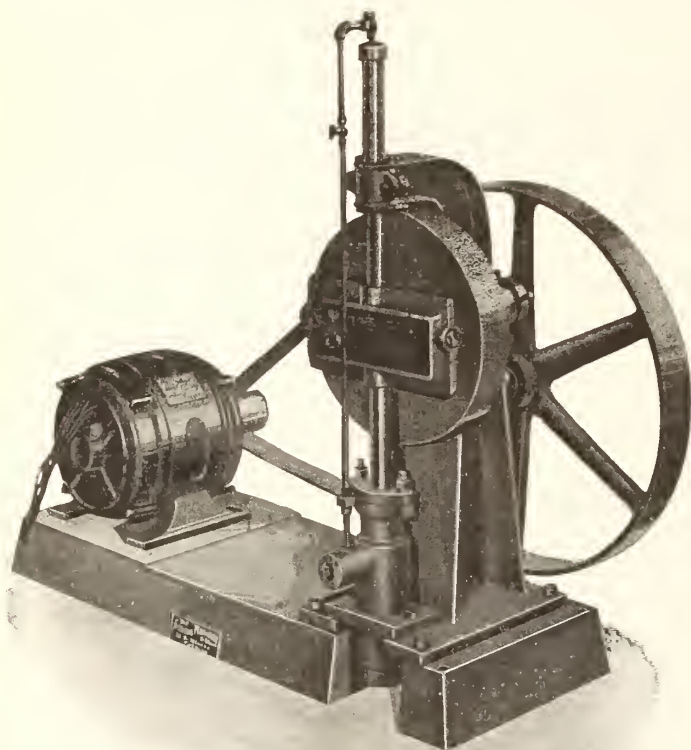
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2½-4 IN.
SQUARE
END
PIPE
CUTTER.

THE BORDEN-CANADIAN CO.

TORONTO, ONTARIO



G.M.C. WATER SYSTEMS

Our New G.M.C. Deep Well Working Head has been designed especially for Hydro Pneumatic Service.

It has a direct-connected compressor, a differential piston and our special G.M.C. Yoke method of operation.

Write for Bulletin No. 9.

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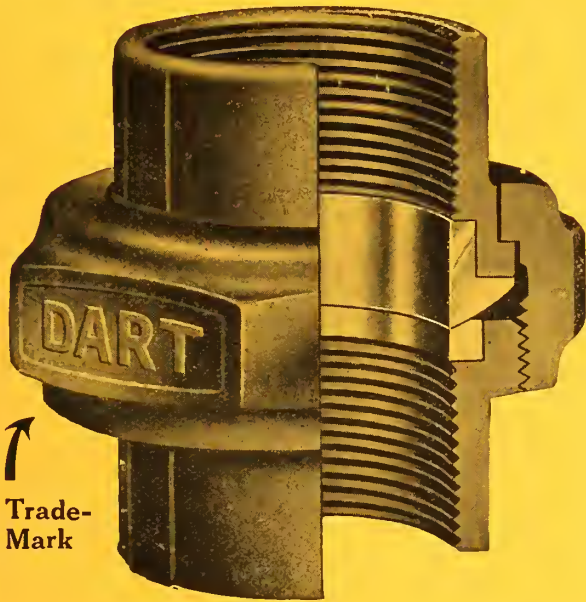
TORONTO, ONT.



Trade-Mark

Service

*will make your pipe-connection
work Complaint-Proof*



The reliability and efficiency of Dart Unions will make them a valuable asset to your business.

When a Dart Union is put on a job it is there to stay PERFECTLY TIGHT until deliberately loosened with a wrench.

There is no deterioration at the joint because both faces are of bronze.

The ball-shaped joint makes connections easy whether pipes are in or out of alignment.

The heavy iron parts will not stretch, nor is the union affected by expansion, contraction or vibration.

Guarantee. If a "Dart" Union isn't right you'll promptly get two new ones for it.

Your jobber has Dart Unions in all convenient types.

**BRONZE
to
BRONZE
at
the Joint**

KERR GATE VALVES

NOW IS THE TIME to show your patriotism, and prove to yourself and others, that VALVES, made in Canada, are equal in quality and workmanship, to any made elsewhere in the World.

BREAK THE HABIT of buying foreign-made goods and get acquainted with Canadian Made valves, which you have perhaps imagined were not quite equal to the Imported variety.

REMEMBER that every dollar spent in Canada for Canadian manufactured goods, means increased consumption of raw materials, and increased employment of Canadian labor.



Quickest possible deliveries.

Consistent Prices.

This plant is at your service.

Help us keep it busy.

Best quality of goods.

Write for Catalog No. 5.

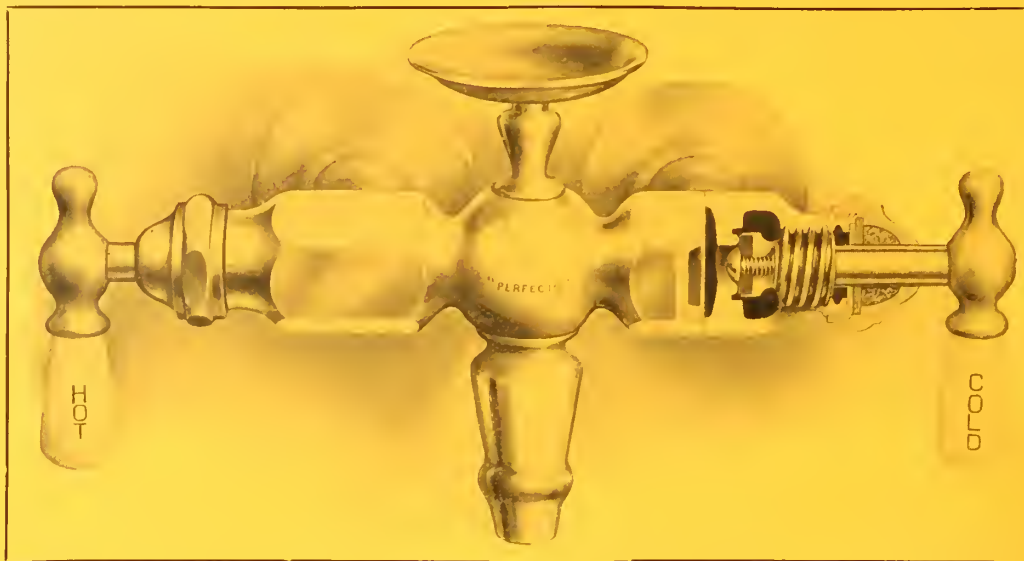
The Kerr Engine Company, Limited

Walkerville,
Ontario

Valves and Hydrants Exclusively

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

GALT BRASS Co. LIMITED



"PERFECTO" (REG. 1913)

Use the "Perfecto" when in a hurry—
Saves half the time and all the worry.

THE
"PERFECTO" BATH COCK is a modern achievement in the quick-pressure or rapid-opening type, giving you lever action, and largest waterway made, coupled with a very attractive design.

HIGH-GRADE
BRASS
AT
MODERATE PRICES

Guarantee

ANY ARTICLE OF OUR
MAKE, PROVING DEFECTIVE
THROUGH INFERIOR METAL
OR IMPROPER WORKMAN-
SHIP ON OUR PART, WILL BE
REPLACED WITH TWO GOOD
ONES AT **NO CHARGE** TO YOU.

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THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

Publication Office : TORONTO, NOVEMBER 16, 1914

No. 22

Standard
Ideal

"Improved" Sink Strainer

We put it in at the Factory and it stays "Put"

Furnished With All Roll Rim and Flat Rim Sinks



FIG. 1.
Fig. 1. Illustration of
"IMPROVED" SINK STRAINER.



FIG. 2

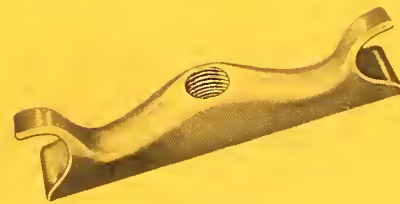


FIG. 3.
Fig. 3. Cross-bar used with our new
"IMPROVED" SINK STRAINER.

Fig. 2. Cross-section showing method of attaching "IMPROVED" STRAINER to the Sink Outlet.

We have been supplying all of our sinks with this new strainer for some time and judging from reports received it has been a real selling feature of our sinks. It is undoubtedly one of the best strainers on the market to-day.

Circular explaining in detail the advantages of this strainer was mailed to you some months ago. If you didn't receive a copy, a duplicate will be mailed on application.

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

TORONTO
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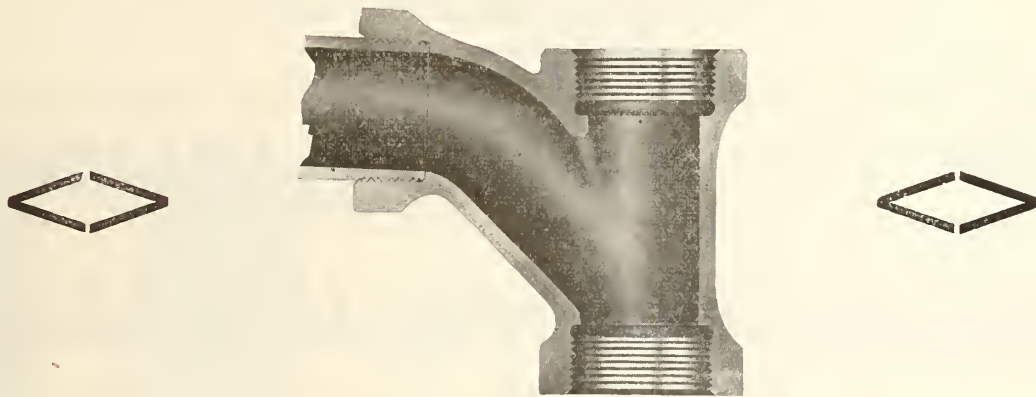
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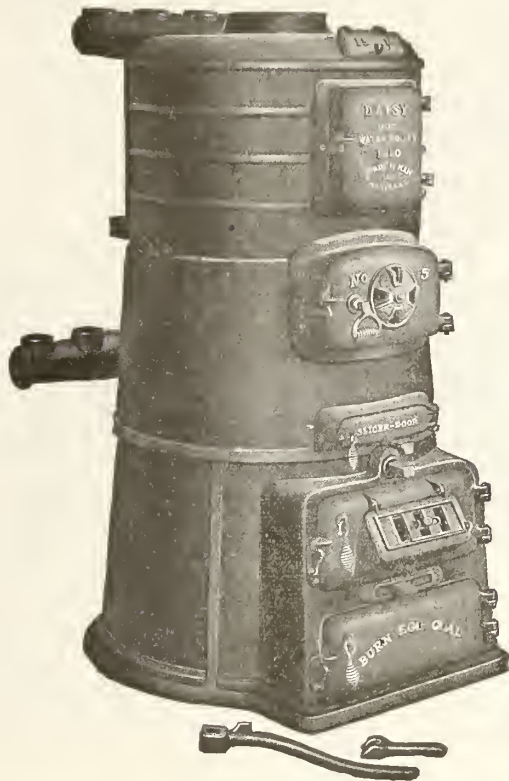
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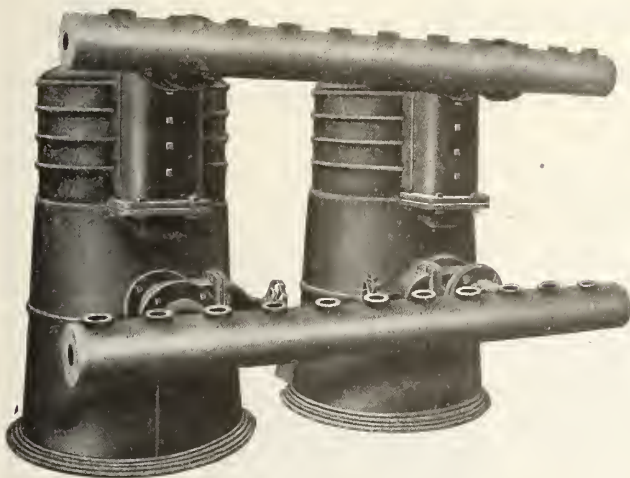
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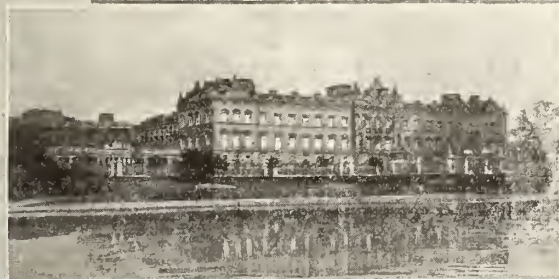
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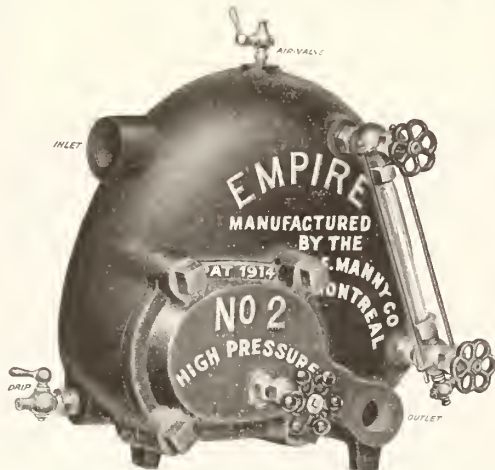
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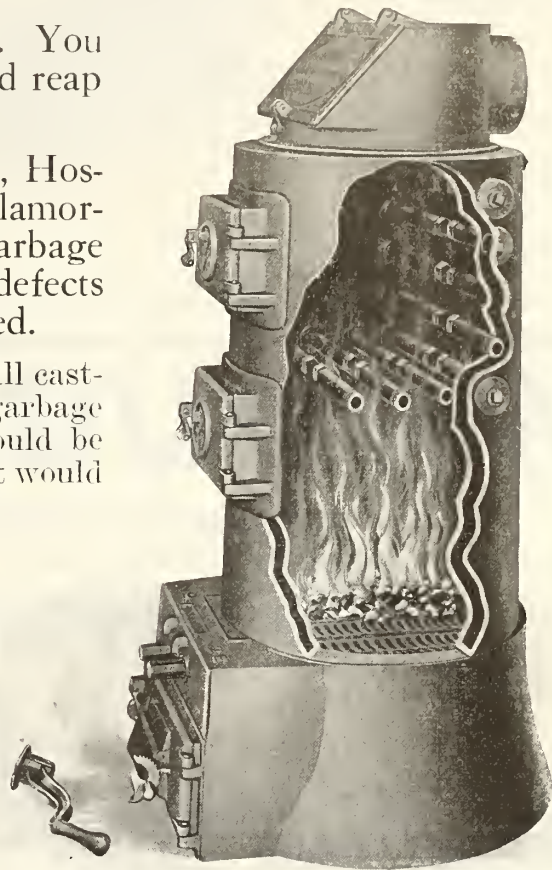
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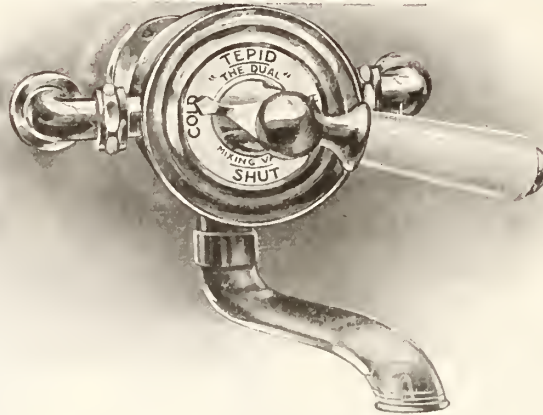
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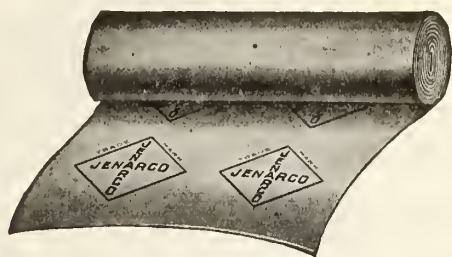
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PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, NOVEMBER 16, 1914

No. 22

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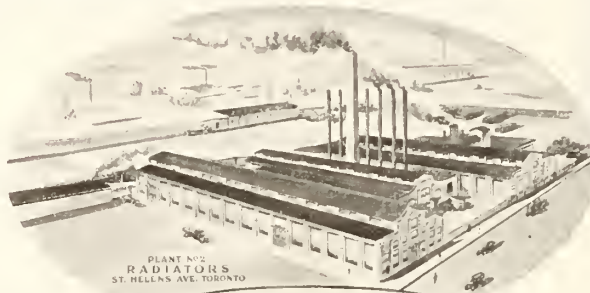
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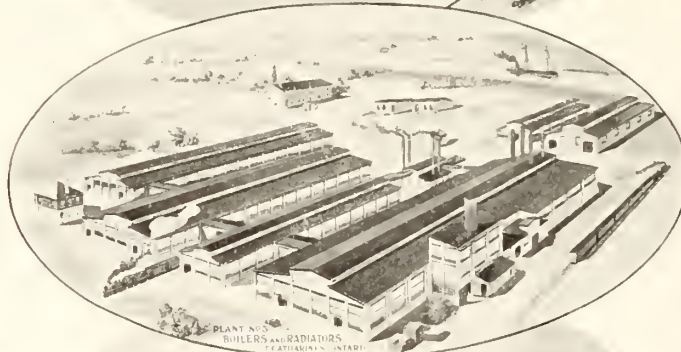


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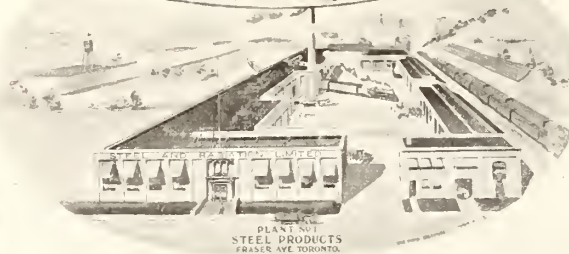
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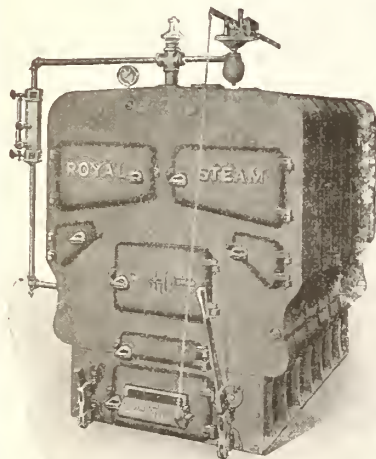
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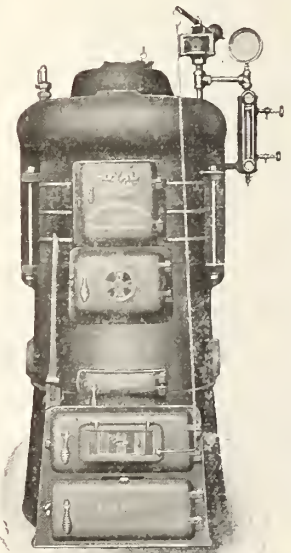


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THE SANITARY ENGINEER

VOL. VIII.

NOVEMBER 16, 1914.

No. 22

Simplified Sanitary Engineering Methods

Showing That to Simplify the Construction of Piping is More to be Desired Than Multiplicity of Piping—The Latter Does Not Necessarily Increase the Efficiency.

By Dr. Wm. Paul Gerhard, S.E., New York.

THE Engineering Magazine of March, 1897, says editorially as follows:

Plea for Simplicity in Plumbing Work.

We are in receipt of a pamphlet written by Mr. William Paul Gerhard, civil engineer who has given a great deal of attention to the heating, ventilation, drainage and sanitation of dwellings and public buildings, and who has made a specialty of sanitary engineering. Mr. Gerhard is also widely and favorably known from his numerous treatises and papers on sanitation and kindred topics; therefore, the opinion he expresses in the particular pamphlet here noticed, entitled "Plumbing Simplified," will command attention.

Doubtless the view that a simpler and less costly system of plumbing than is now practiced can be made equally serviceable and effective will be combated, especially by those whose commercial interests lie in maintaining the use of current appliances.

If, however, Mr. Gerhard has fortified his view by irrefragable arguments, the employment of simpler modes will be only a question of time. Early in his essay the author makes his avowal of his advocacy of good, sound and safe plumbing work, and puts in a disclaimer of any "personal interest in any patented plumbing device or in a special trap," thus defending himself in advance against the suspicion that his views are biased by motives which such an interest might create. . . . The paper is both progressive and aggressive. It closes with a prediction that "the trap vent law will ultimately be repealed, and that simpler and better methods will take its place." If the system proposed by Mr. Gerhard is better than or even as good as, the trap vent system, its superior cheapness is sure to bring it to the front.

An editorial published in the Journal of the American Medical Association, of April 10, 1897, contained the following:

And now comes a sanitary engineer of prominence, Mr. William Paul Gerhard, of New York, who is led by years of observation to believe that the trap venting law is a mistake which will ultimately be remedied by repeal. He makes use of non-siphoning water-sealed traps and, in case of water closets, common S-traps with such a depth of trap seal as will not be destroyed by the discharge of other fixtures. In a small building having only one or two fixtures on each floor, he leads each waste into the vertical soil pipe by a separate entrance and when untrammelled by plumbing regulations, does away with the separate vent pipe for each trap, maintaining that the air movement through the soil pipe will prevent siphonage and that the rush of liquid through the short wastes will keep their interior clean notwithstanding the absence of vents or ventilation. In a large building where several water closets, basins and baths are aggregated on each floor, he leads each waste by a separate opening into the branch of the soil pipe. This branch does not begin by a dead end at the distal fixture, but by an open end above the roof, whence it descends of full size to its junction with the soil pipe, receiving its separate wastes near this junction. Its free opening above enables it to act as a vent for the traps connected with it, while its communication below with the ventilated soil pipe gives free passage to an air movement through it. It is not to be expected that this air movement will be as free as that through the direct vertical extension of the soil pipe, but the frequency with which the branch is flushed by the use of its fixtures keeps it practically clean.

There is no question that the separate

venting of each trap complicates the piping and adds largely to the expense of our present system of plumbing. If Mr. Gerhard's experience is sustained by further investigation an important modification of the plumbing regulations would be warranted. Ten or fifteen years ago every sanitarian would have protested against a proposition to modify them, and even now many who have not given this subject consideration would no doubt promptly vote it down as a backward step in the progress of modern sanitation; but we must remember that the present regulations with their positive requirement of a vent for every trap were formulated when sewer air was regarded as sui generis in its deadly and penetrating qualities, and when it was considered that any deviation from the accepted system might be followed by the most dangerous consequences. In affecting protection at that time it is possible that the pendulum may have swung too far to one side.

. . . . When a proposition of this kind comes from an experienced worker and observer in this particular field of sanitation it might be well for municipal authorities to consider the subject with a view to determining whether security with simplification and materially lessened expense might not be attained by a revision of their plumbing regulations.

Finally, I quote the opinion expressed by the London Building News, of February 12, 1897:

Mr. William Paul Gerhard, C.E., consulting engineer, New York, has written a sensible little brochure under this title. He observes that modern plumbing work, as carried out in the States, and as required by the rules of health and building departments, is open to the objection that it is unduly complicated and costly. The "trap venting law" in New York, Boston and other places, requires that all traps must have a

"vent pipe connected at, or near the crown of the trap, and extended either separately up to the roof, or connected with the soil pipe line above the highest fixture." This rule has been followed generally in both large and small cities. Mr. Gerhard, who is an acknowledged authority on the subject of sanitary matters, says the branch trap ventilation is carried too far, that it creates new and serious dangers and is costly. . . . Mr. Gerhard's system is certainly worth the attention of all plumbers and sanitary authorities, especially those in the States. The system as shown avoids siphonage, as air follows the discharge action in all the pipes, and the avoidance of the back-air pipe, with all its attendant joints and complications, simplifies the arrangement. Many of the imperfect systems in use are owing to the following of rules which were well intended at the outset, but which are not applicable to ordinary cases. The small soil pipes, long branch pipes without an independent outlet, dead ends, are the sources of much trouble; and the author has, by simply giving each pipe a free current of air through it, and by connecting the branch pipe with the vertical lines of soil or waste of the same size, shown how a building may be effectually drained. The article is worth attention by the authorities and by the profession generally, and those who desire to simplify existing sanitary construction.

* * * * *

Since my article on "Plumbing Simplified" was published, many local Boards of Health and plumbing inspectors have written me and conferred with me in regard to the matter. Several cities have amended their plumbing regulations in accordance with the methods suggested, and others have appointed committees to revise their rules.

In December, 1896, the town authorities of Brookline, Mass., appointed a special committee for this purpose, and from the report rendered on this subject by Mr. William Atkinson, architect, of Boston, which suggests the amendment of the present laws, so that in certain cases air pipes to traps shall not be required, I quote the following:

Our plumbing regulations provide that "traps shall be protected from siphonage or air pressure by special cast iron air pipes of a size not less than the waste pipes they serve, to run from the crown of the trap. The use of the separate air pipes to traps, or the "back-venting" of traps, as it is called, is advocated for two reasons:

First—To prevent traps from being forced by siphonage or back pressure.

Second—To aerate the traps and the

branch waste pipes to which they are connected.

In regard to the first reason I find that the same object may be accomplished by less complicated, and therefore better, methods. In regard to the second reason I find that the aeration of traps and short connecting lines of waste pipe is sufficiently accomplished by the influx of fresh air which accompanies every discharge of waste water through them.

The reasons why back-air pipes should be discarded, provided that there exist simpler methods of accomplishing the same ends, are as follows:

First—They increase the liability of traps to loss of seal by evaporation.

Second — They afford opportunities for making "bye-passes."

Third—They increase the amount of piping and the number of pipe joints, thus making more plumbing to look after and keep in repair.

Fourth—They increase the cost of plumbing.

But the most serious objection to "back venting" is, that by promoting evaporation of the water seal, it actually makes traps, in many cases, a less secure barrier to the entrance of vitiated air into our dwellings than they would be without it. In ordinary S-traps "loss of seal by evaporation will occur in about two months if the trap is not ventilated, and in about two weeks if it is ventilated." In winter the evaporation produced by ventilation is so rapid as to destroy the seal of an ordinary 1½-inch machine-made S-trap in from four to eleven days, according to the nature of the current.

It therefore appears that where the traps are "back-vented," they ought to be flushed with water at least once in every four days; whereas, when unvented they may be left unused for two months without danger. Now there are many cases where plumbing fixtures are likely to remain more than four days without being used. In such cases "back-venting" becomes a serious danger.

With so many reasons against "back-venting" it would seem to be important to examine into the subject to see if it is really necessary in all cases, especially as it is contended by eminent sanitary authorities that it is not.

The most reliable recorded experiments bearing upon this subject are those of Messrs. Putnam and Rice above referred to, and those of Mr. George E. Waring, Jr., and Messrs. Edward S. Philbrick and Ernest W. Bowditch. These experiments show the following facts:

1. Small S-traps and certain forms of water closet traps are very weak in resisting siphonage.

2. "Round traps" and certain modified forms of the S-trap are very strong in resisting siphonage.

3. "Back-venting" increases the resistance of S traps to siphonage.

4. "Round traps" unvented are stronger in resisting siphonage than S-traps "back-vented."

5. The efficiency of "back-venting" decreases as the length of the vent pipe is increased.

6. Any kind of a water-seal trap, whether "back-vented" or not, can be siphoned out, provided the test is severe enough.

7. Ventilation of the main stack of soil pipe at the top and bottom considerably reduces siphonic action.

8. The provision of an independent waste pipe for each trap considerably reduces siphonic action.

9. Making the main stack of soil pipe of larger diameter than any of the trap waste pipes considerably reduces siphonic action.

10. Traps may be used to resist "back-pressure" by a proper length of inlet pipe.

11. "Back-pressure" may be reduced to almost nothing if the piping is properly designed.

These experiments do not give any information as to the following points:

1. Whether or not the efficiency of round traps is increased by "back-venting" and to what extent, if it is increased.

2. The comparative efficiency of different kinds of water closet traps in resisting siphonage.

3. The effect of siphonic action on traps located above the fixture producing the siphonic action.

4. The effect of siphonic action on traps located on horizontal or inclined lines of waste pipe.

5. To what extent siphonic action may be reduced by varying the inclination of the waste pipes of the fixtures.

6. To what extent siphonic action may be reduced by making the trap outlet larger than the inlet pipe.

7. While these experiments show at least three different methods, other than "back-venting," by which siphonic action may be reduced, yet they do not show to what extent it may be reduced by an intelligent combination of all these methods.

Mr. Waring's conclusion was "that the separate ventilation of traps where the main soil pipe is four inches in diameter and open at the top and bottom, is unnecessary." In the report of Messrs. Philbrick and Bowditch, after a general statement of the facts ascertained by the experiments, the following recommendations are made: "The ordinary S-trap

alone, with ample air vent, is recommended for use under water closets and for all fixtures where its proper ventilation can be secured with reasonable limits of expense. The proper size and length of such vent pipes must be largely a matter of judgment." It is then stated that the "back-venting" of round traps is "of doubtful utility." After a statement of certain objections to round traps (which objections, however, have since been overcome by improvements in its design) it is stated that they "may often be properly used, however, in old houses, in places where the introduction of a vent might be inconvenient or costly." It is then stated that "the best and most simple remedy for the siphoning of traps in most cases is undoubtedly to be found in the introduction of air at the normal pressure at the crown of the trap," but that "no definite rules can be given for the size or length of vent pipes." . . . If it is true that "back-venting" is not of such importance, but that considerations of expense and convenience may sometimes outweigh it, and if in some cases it is of doubtful ability, and if it is true that no definite rules can be given for applying it, and that in many cases it is a matter of judgment whether it ought to be employed or not, then it seems to me that a law which requires the "back-venting" of all traps indiscriminately, is in need of amendment. The only reason which can be brought forward in support of such a requirement is the supposed necessity for providing more aeration for the traps than they would otherwise get. I can find no facts to support this contention. It appears to be entirely a matter of theory. On the other hand it has been clearly shown that this very aeration of the trap by "back-venting" induces a rapid loss of its water-seal by evaporation.

Having now examined at some length into the two reasons for which "back-venting" is advocated, I venture to submit the two following propositions:

1. That no trap ought to be used in plumbing that requires to be "back-vented" to protect it from siphonage.
2. That it is better plumbing practice to dispense with the uncertain benefits of "back-venting" in aerating the trap rather than incur the certain danger of loss of seal by evaporation which "back-venting" involves.

That the "back-vent" law is in urgent need of revision is amply shown, I think, by the following extracts from recent correspondence on the subject:

Mr. George E. Waring, Jr., wrote me as follows (May 21, 1897):

"Continued experience and observation tend more and more to confirm my opinion that the 'back-venting' of traps,

aside from its great cost, does more harm than good. That is to say, a trap is more likely to lose its seal if it is back-vented than if it is not."

Mr. Frederic Tudor wrote me as follows (May 26, 1897):

"The whole subject demands exhaustive investigation and amendment of the law to suit the facts ascertained."

Mr. William Paul Gerhard wrote me as follows (June 26, 1887):

"I am heartily in sympathy with your effort to improve the present regulations, particularly as to the rules requiring every trap to be back-vented at the crown."

A number of cities and towns already exempt certain traps from "back-venting," viz.: Providence, R.I.; Newport, R.I.; Pawtucket, R.I.; Greenfield, Mass.; Rochester, N.Y.; Elmira, N.Y.; Hornellsville, N.Y.; Brooklyn, N.Y.; Duluth, Minn.; Minneapolis, Minn.; Denver, Col.; Sacramento, Cal.; Chicago, Ill.

Our own law exempts certain cases in repair work in old buildings. It has thus been widely recognized, even in plumbing laws, that there are some cases in which "back-venting" is unnecessary.

From the annual report of the Plumbing Inspector of St. Paul, Minn., I take the following remarks regarding the ventilation of traps:

I have made a somewhat limited examination of the practical effect and desirability of the present system of so-called trap ventilation. My investigations confirm the opinion I have held for some time, that the crown or back-venting of traps, as now practised, is worse than useless, and its attendant heavy expense to builders is very often the cause of curtailing a large amount of necessary plumbing work. The most serious objection, however, to this pernicious custom is the sense of false security given to the owner or tenant of a house provided with so-called modern plumbing.

I made examinations in twenty-three houses, the plumbing work in which was done in the very best and most workmanlike manner, all of them having been constructed within the last seven years, in conformity with the ordinance governing plumbing. In twelve of the houses examined I found all of the vent pipes from traps under kitchen sinks completely stopped by congealed grease and particles of vegetable matter for a space from three inches to a foot above the crown of the traps which they were supposed to "ventilate." In most cases a strong wire was required to dislodge the obstruction.

Of the other eleven kitchen sink traps examined, I found only one that was perfectly clear, and all the rest of the

trap vents in this house were found in the same condition, including the water closet vent. . . . In seven of the houses I found a soft, slimy substance adhering to the interior surface of the vent pipes for two or three inches above the crown of the trap. While the stoppage was not complete, there was every indication that an entire obstruction would soon result. The remaining three traps examined were partially stopped up; but in the case of these the vent was placed below the crown of the trap and so fashioned that the lower line followed the descent of the waste pipe. I also found, where couplings were used at the foot of wrought iron vent pipes, that the dislodged particles of rust form an accumulation sufficient in most cases to stop the opening in the bend. Wrought iron pipes without a lining of some non-corrosive substance should not be used for the purpose of back venting. The traps used in a majority of the cases examined were the usual form of "S" and "P" traps, with the regulation seal usually found in such traps. The result from stoppages, as indicated, will at once be apparent to any one who has given the matter the slightest attention. In this latitude, where for weeks at a time the ends of soil and vent pipes—usually extending two feet above the roof—are completely sealed with accumulations of hoar frost, rendering them totally useless for the purpose of vents or for the escape of gases generated in the sewers, the matter assumes a very serious phase, requiring intelligent and immediate action.

With the vent pipes over the crowns of traps inoperative, and in addition the ends of soil pipes frozen solid, the inquiry may well be made, how is it possible to avoid contagious disease becoming epidemic? . . . The plumbing ordinance as at present in force leaves the plumber no choice as to how the work should be constructed, no matter what his knowledge or experience may be. He is arbitrarily compelled by legislative enactment, specifying penalties for infractions, to continue to observe the requirements of an obsolete ordinance.

Domestic engineering, with all its attendant problems, is a progressive science, and advantage should be taken of discoveries and improvements made in the advancement of so important a part of our domestic hygiene. The ordinance should be remodeled to conform to modern practice.

Salesmen should make the razor a daily acquaintance.

* * *

No one will wish Kaiser Bill many happy returns of The Day.

New Sanitary and Heating Goods

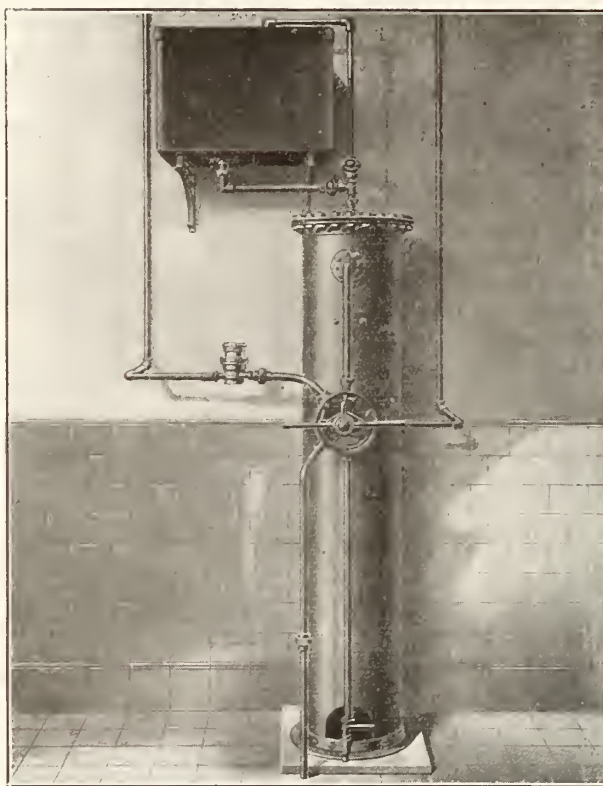
NO. 104 C. & L. GASOLINE TORCH.

The Clayton & Lambert Mfg. Co., Detroit, Mich., have recently added to their line a new quart size torch, the No. 104, herewith illustrated. The burner is made of special generator metal which, it is claimed, holds the heat longer than the ordinary bronze used in many torches on the market, making the combustion of the fuel more perfect and complete, and producing a steady, pure blue flame of intense heat. The makers claim that a surprisingly small amount of fuel is burned compared with the results obtained in heat efficiency. The tank is made of heavy seamless drawn brass strongly reinforced on the inside. The bottom is funnel shaped, which makes it easy to fill, fitted with an improved non-leaking filler plug made with leather imbedded into the metal. Patented automatic brass pump with double spring automatic check valve is fitted to the tank and quickly supplies the required air pressure. A hook and support on the burner is made for holding a soldering copper. The new No. 103 torch is similar but with plain burner tube. A complete catalogue showing the complete line of Gasoline Torches, Fire Pots and

catalog which is now being distributed to the trade, every sanitary and heating engineer will do well to procure one of

8 in. long by 1 in. diameter to the finest point.

The makers state that as kerosene con-



Type of Water-Softening Filter for Households.



Clayton & Lambert No. 104 Torch.

Braziers will be mailed by the manufacturers to those interested, on request.

WATER-SOFTENING FILTER.

There are quite a large number of districts where the water used for domestic purposes is found to be very hard, sanitary engineers will find in those districts that water fronts are soon choked up, that gas water heaters do not last long on account of the pipes becoming coated inside with a deposit of lime or other chemical matter, which causes them to burn out, boilers lose their efficiency to no small degree.

The Permutit Company are manufacturing a line of mechanical water softeners which is fully described in their new

these books by writing to the Permutit Company, 30 East 42nd street, New York.

HAUCK KEROSENE TORCH.

A kerosene torch of new and novel design has just been placed on the market by the Hauck Mfg. Co., of Brooklyn, N.Y.

The makers say it was especially designed to take the place of the gasoline torch and fills a long-felt want in places where the use of the gasoline torch is prohibited or restricted. This applies particularly to garages, office buildings, hotels, hospitals, etc. Telephone companies, electricians, painters, tinsmiths, machinists and plumbers should welcome the new torch both for its safety and economy.

The most important feature is the construction of the bronze burner. The oil passage ways are especially large and so arranged that only one plug has to be unscrewed in order to clean the whole burner instantly.

By a special oil regulating valve the flame can be adjusted to any size from

tains more heating units than gasoline, the temperature obtained with this torch is much higher than that of the gasoline torch.

It is also claimed that strong wind or cold weather will not affect the flame



Hauck Kerosene Torch.

in any way and it is therefore especially recommended to linemen and those working outside.

The torch is also furnished in connection with a light furnace for melting solder and heating soldering coppers.

The Heating and Ventilating of Our Homes

Being an Article Reprinted from The Health Bulletin of Toronto
—Sanitary Engineers Should Take up the Problem of Humidifying
the Atmosphere in Our Homes.

NO one will question for a moment the bad effects on health of improper ventilation. We emphasize the beneficial effects of open-air treatment of tuberculosis and pneumonia, forgetting that the same fresh air treatment, if as

air requires a higher temperature to produce the same sensation of warmth and comfort than does an atmosphere with a proper percentage of moisture.

To overcome this dryness, small reservoirs for heating water have been attached to the furnaces; but these are rarely kept full, and even when they are, they are not at all adequate; for instance, air at 25 degrees Fahrenheit (7 degrees of frost), even if saturated with moisture, if heated to 70 degrees, would require the addition of a half pint of water to every 1,000 cubic feet to give it a humidity or moisture of 65 per cent., which is practically normal.

Some conception of the amount of moisture required, and how far the air in our homes, schools and factories falls short of it, can be had from the following description of the precautions taken by the American Bell Telephone Company in their chief building in Boston, which has a capacity of 450,000 cubic feet and a day population of 450 persons.

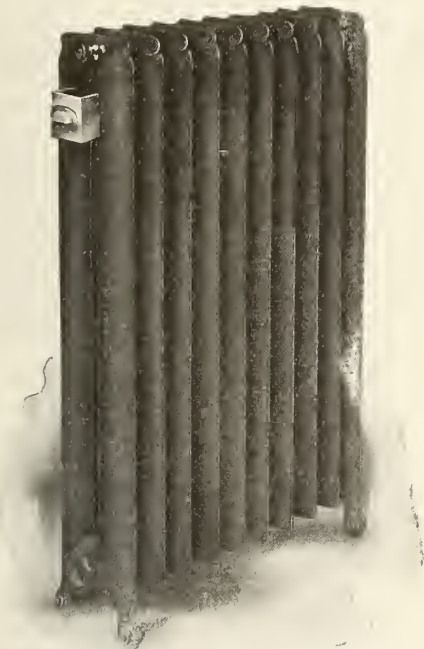
The fresh air, which is distributed by a mechanical system, is drawn into the building at the rate of 26,000 cubic feet per minute, and has moisture added so as to contain about 50 per cent. of relative humidity. To secure this condition, 676 gallons of water, in the form of

which had been heated with difficulty before, are now made more comfortable; and in the whole building three degrees less heat is required to maintain a comfortable temperature. There has been a noticeable absence of coughs during the winter among the employees.

Various humidifiers have been suggested, of which a very efficient and simple one is the exposing of the air from a register or radiator to moisture, by having it pass through a surface of cotton wick—one end of which is submerged in a reservoir or vessel containing water, and which it attached to the radiator. It has been demonstrated that by means of this contrivance the relative humidity of a room can be kept between 55 and 60 degrees Fahrenheit by evaporating about $4\frac{1}{2}$ quarts per day; and a temperature of 65 degrees so maintained is as comfortable as one of 70 in a dry atmosphere.

Another method of humidifying the air is adopted by having small pans made to hang on the back of either steam or hot water radiators. These require to be kept full, they can be made of either copper or galvanized iron.

The Dominion Radiator Company have a specially designed radiator and humidifying tank combined, out of which we show. The radiator is recess-



By Courtesy of the Dominion Radiator Co., Ltd., Toronto.

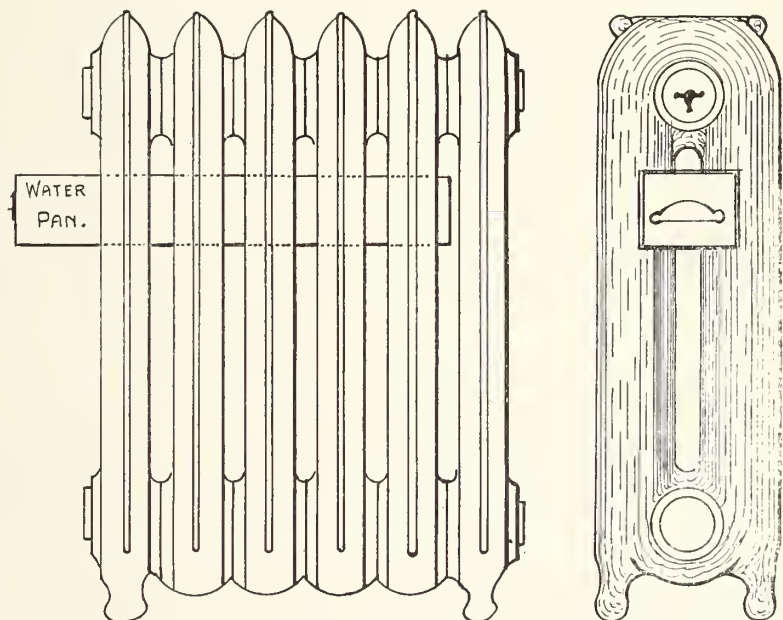
rigidly carried out, would prevent a large proportion of cases of both of these diseases.

In the heating of our homes, the three cardinal points are: proper temperature; proper humidity or moisture; and a current of air—in short, the securing of proper climatic conditions.

The normal out-door air contains from 65 per cent. to 75 per cent. of moisture. Pass this through a hot-air furnace, and by the time it reaches our living or sleeping rooms it will not contain more than 40 to 50 per cent. of moisture. The same is true in houses heated by hot water where no provision is made for supplying moisture. The result is that this dried-out air craves moisture, and will take it up from all surrounding bodies—from our skin, the mucous membrane of our mouths, noses and throats; and is in a large measure responsible for the dry, hacking laryngeal coughs so prevalent in winter. Furthermore, from an economic standpoint, this method of heating without moisture is very extravagant, for very dry

steam, are mixed with the air in ten hours, or about one and one half barrels per hour. Certain parts of the building

ed so as to allow the pan to be drawn out like a drawer to be filled. Heating
(Continued on page 29.)



Plan and elevation of Dominion Radiator Co.'s humidifying radiator.

Analysis of Can. Sanitary Engineering By-laws

Commenting Upon the By-law Known as By-law No. 528, Governing Sanitary Engineers and Sanitary Engineering Construction in the Town of Waterloo, Ontario.

Continued from last issue.

THE next clause to be dealt with is that of clause 8, part 2. This clause deals with the matter of inspectors, and reads as follows:—

Clause 8.—The council may by resolution, from time to time, appoint an inspector of plumbing, whose duty it shall be to enforce the provisions of the by-law, which shall herewith be passed, affecting the matter herein set forth; and until such appointment shall be made, and in case of absence of the inspector or of the position of inspector being vacant, the town engineer shall be inspector of the plumbing.

This clause speaks for itself; but in spite of the fact that the engineer may be a man of splendid qualifications as a town engineer, he may not always be fully qualified as a plumbing inspector. He may be a splendid official as regards seeing that the letter of the law is carried out, yet, not having learned the trade of sanitary engineering construction and the thousand-and-one details involved, he may not be qualified to know when any deviation from the letter of the law would be permissible. All rules and by-laws are necessary, yet it is often good practice under certain conditions to depart from them.

Clause 9.—The inspector shall have the right to enter upon and into any premises at all reasonable hours, and from time to time, for the purpose of enforcing compliance with the provisions of this or any other by-law or rules and regulations prescribed by the council, and which may at any time be in force in the town of Waterloo, for licensing and regulating plumbers and regulating plumbing and sanitary matters.

This clause is very commendable. It is one which can be made of great use to the public. Many a time repair work is done by men who are not competent, and who start a small shop, cut prices and are a menace both to the public and the trade. If the inspector can spare the time, he can be of great use by making thorough inspection of every house, and in case he finds defective plumbing which requires repairing he can give the owners an idea as to what should be done. If later on he found the work was not done properly he would be able to trace the party who had done the work.

Clause 10.—It shall not be lawful to extend any drain for the reception of sewage or waste water under or into any building, or to connect the same with any public or other sewer or drain, unless the said drain shall in its plan and construction conform to the following requirements in this by-law contained.

Clause 11.—If directed by the inspector, cellars must be drained by carrying a vitrified drain tile from a point not less than one foot below the lowest part of the cellar to be drained, to the drain tile laid alongside the street sewer.

Clause 12.—Such vitrified drain tile shall be trapped immediately within the cellar wall; such trap to be placed in a small well not less than one square foot and one foot deep, into which the cellar water will flow; this well to be closed with a cast iron plate one-half inch thick and lapped not less than one-half inch; trap to be placed in well according to drawing shown at the end of this by-law. In case the vitrified drain tile is laid below the cellar floor with no dirt opening whatever into the cellar, the trap and well above mentioned may be omitted.

Our readers must not confuse these three clauses, 10, 11 and 12, as having any bearing upon the house drain to be used for domestic or soil wastes. They simply refer to cellar drainage and weeping tile drains, which would be necessary to keep the cellars dry.

Clause 13.—Before proceeding to construct any portion of the drainage system or plumbing of any house or building, except necessary repairs, the owner or agent shall file with the inspector a plan or description of the work proposed, showing the whole drainage system from its connection with the public street sewer to its terminus above the roof; and the sum of one dollar shall be paid upon the filing of such plans or description, for the examination of the plans and the inspection of such premises, and for testing the plumbing. Blanks for plans will be furnished by the inspector.

This clause is to be commended to a certain extent. We do not know why repairs should be excepted. There are quite a number of repairs which do not require the supervision of the inspector,

but there are also quite a number that do. For instance, we have heard of partial installations being put in a building which have, as far as they have gone, been in accordance with by-laws. Then additional fixtures have been put in at a later date which did not conform to the existing by-law. Many a time new fixtures have been installed and fitted to old piping, and have not been made up-to-date by venting where necessary. We should like to see a clause demanding that even when repairs are to be made to any portion of the waste or vent lines on the sewer side of traps that all such repairs should be done in accordance with the by-law, and finally inspected by the inspector or town engineer. Such a clause or amendment would prevent work being botched, as is the case to-day in many a town.

Clause 14.—No work shall be commenced until such plans, signed by a licensed plumber and the owner or his agent, shall have been approved by the inspector, and a permit granted by him for proceeding with the plumbing. Any alterations made to the original plan must be approved in writing by the inspector.

This clause is very clear and to the point, of a general nature, and requires little or no commenting upon.

(Continued in next issue.)

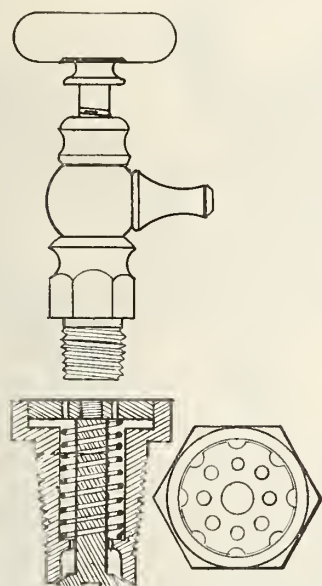
CANADIANS AT VALCARTIER.

On pages 20 and 21 is shown two full-page views taken at Valcartier, the training ground of the first Canadian contingent. These views are shown by the courtesy of H. S. Howland, Sons & Co., wholesale hardware merchants, Toronto, and were also published in the November issue of "Howland's Monthly Bulletin." This bulletin will be very interesting to sanitary and heating engineers for the simple reason that a large display of tools of all kinds is shown, making it, as it were, doubly interesting. The hardware, sanitary and heating business has without doubt supplied its fair share of volunteers for the front, and those who remain at home deserve every credit by the way they are holding the business end up. In spite of the fact that the building trade has been given the worst shock of any as a result of this dreadful war, those engaged in the trade have responded with renewed energy, both from a business as well as a military standpoint.

Heating and Ventilation Past, Present and Future

These Articles Will Take up the Simplest Methods Adopted in the Past, the Present and the Possible Methods for the Future, and Will be Written as Free From Technical Phraseology as Possible, so as to be Within the Scope of the Lay Mind.

THE next system of steam heating to be mentioned after the regular air line system is that of a common two pipe system. Fig. 1 shows such a system, the greatest care should be taken that all pipe lines have an even grade. If one inch in ten feet is allowed, all lines should be the same. There should be no acute angles or branches taken off any horizontal lines, either



SECTIONAL & TOP VIEW

Common air valve and anti-vacuum valve.

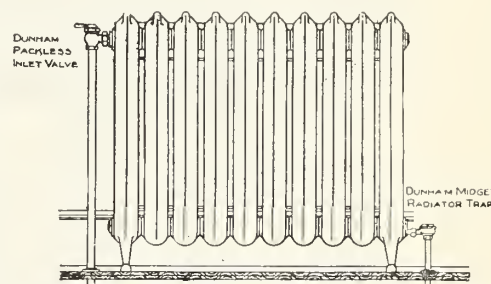
steam or returns, and too many branches on the returns should not be close together. The heating engineer should take more note regarding the amount of friction caused by sharp turns. For instance suppose there be a number of return branches placed on the main return close to an elbow, there is bound to be a certain amount of objectionable friction; and many a case has been found where a radiator placed on the first floor above the main, could not be properly drained. When such a condition arises it is well to make all first radiators drain into a wet return this giving them the benefit of all the space between the return valve and the height of the water-line at the boiler. However, when all is said and done, a two-pipe system should not only be controlled by special valves at the steam supply but also at the return. The supply valve should never be connected at the bottom as shown in Fig. 1. (We are here simply showing an old practice.) Fig. 2

Radiator Tappings Required for 2-Pipe Steam Heating System.

Sq. feet of Radiation.	Steam Line.	Return line.
10 to 30	$\frac{3}{4}$ inch pipe	$\frac{3}{4}$ inch pipe
30 to 48	1 inch pipe	$\frac{3}{4}$ inch pipe
48 to 96	$1\frac{1}{4}$ inch pipe	1 inch pipe
96 to 150	$1\frac{1}{2}$ inch pipe	$1\frac{1}{4}$ inch pipe
150 to 200	2 inch pipe	$1\frac{1}{2}$ inch pipe

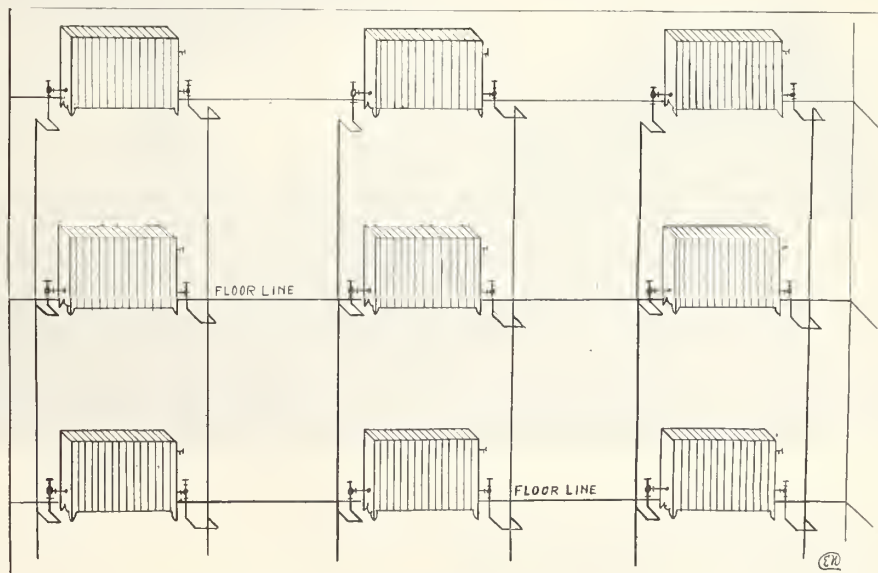
shows a proper method. The valve A should also be of a graduated type, and indexed. The return valve should be one, of which it is claimed there are many, that will pass air and water, and will close to steam. No doubt these valves can be procured and if they do the work they are set to do, it will not be necessary to place air valves on the radiators. The writer remembers very well taking out an old system of steam heating, where all the coils were made of $1\frac{1}{2}$ tube, each coil was not only fitted with an air valve which was of the common type as shown herewith, but was also fitted with a vacuum valve. The idea was that if the steam was turned off, the water of condensation was likely to be held in the radiator, even though the return valve was left open, this cooling of the coil would create a vacuum and hold the water, and the vacuum valve as shown would break the vacuum and allow the water to return. A bad feature in that job was that when the steam was turned on the air valve had to be opened. Another installation was exactly the

same except that a separate air line was carried to a point near the boiler, and the engineer had to make a certain number of trips round the building every day to see that every coil was working. On his first trip he began by opening



Improved method of radiator connection adopted by the C. A. Dunham Co., Ltd., Toronto.

every air valve at the boiler, and those which gave out steam were O-K and each being tagged he knew which were not working; but the trip round had to be made for fear someone had turned off (Continued on page 26.)



Riser and returns for common two-pipe steam system.



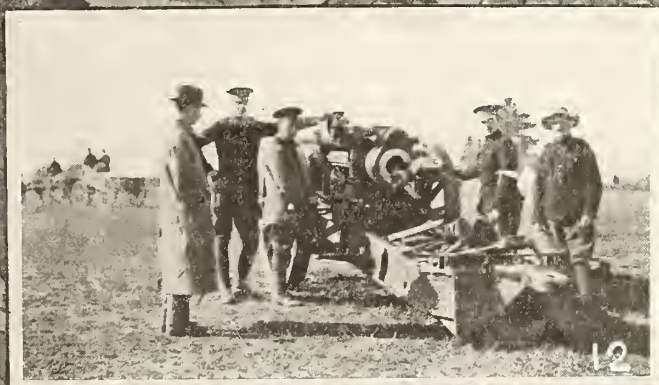
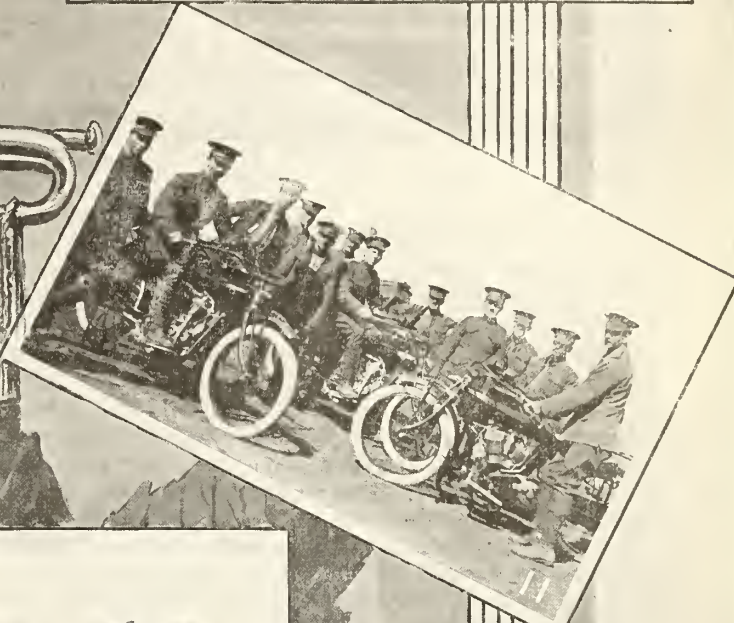
CANADIANS AT VALCARTIER.

- No. 1—A company returning from rifle practice at the ranges.
 No. 2—Cavalry manoeuvres.
 No. 3—A squad of engineers making and transporting pontoons.
 No. 4—Breakfast call, usually about 7 o'clock.

Cuts by courtesy H. S. Howland, Sons & Co., Limited, Toronto.

- No. 5—Rifle practice at the ranges.
 No. 6—Highlanders receiving their first lesson in trench digging.
 No. 7—H.R.H. the Duke of Connaught inspecting the troops

Photo by Courtesy C N. Railway.



CANADIANS AT VALCARTIER.

No. 8—On parade.

No. 9—On the march.

No. 10—Pontoon bridge erected over the Jacques Cartier River.

No. 11—A part of the Motor Cycle Corps.

No. 12—Photograph of the breech of the 60-pounder Field Gun.

No. 13—One of the many booths, erected practically over night.

No. 14—Another photograph of H.R.H. the Duke of Connaught inspecting the troops.

*Cuts by courtesy H. S. Howland, Sons & Co., Limited, Toronto.**Photos by Courtesy C. N. Railway.*

The Sanitary Engineer

Plumber and Steamfitter of Canada

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TORONTO, NOVEMBER 16, 1914

Get Out Into the Open

SPEAKING TO a medical practitioner the other day, he expressed surprise at the amount of skill and practical knowledge which seemed to be required by the ordinary heating engineer, providing that engineer was in the business to give service. He could not tell what direct radiation meant except when such radiation was from a stove, etc. Indirect radiation and direct indirect, he could make no guess at, but when the question of humidity began to be discussed our medical friend was right on the job. He was, however, surprised to know that various methods were being adopted by the heating engineer, some of which had never been heard of before. No doubt the question of humidity has never received serious consideration by the heating engineer. All that seemed to be necessary was to "Warm the place to 70 degrees." It never dawned upon the heating engineer that a lower degree of heat would be far more healthy and comfortable if the air be saturated from 50 to 70 per cent., 65 being a happy medium for most physical constitutions. These few facts are only voiced with a view of showing that both sanitary heating and ventilating engineers should get out into the open and devote a little time during these slack times to such study as can be put into practice in the near future.

Get in touch with the medical faculty, reciprocate a little. They are, by reason of their choice of calling, our very brothers. Our work is all with the aim of preventing the scores of ills from which humanity is bound to suffer, if allowed to congregate in unsanitary environments, or poorly heated homes or buildings. The medical faculty have been occupied until very recent years in fighting diseases and curing ills. Yet even they, to-day, are devoting a very large portion of their time to studies with a view of preventing all diseases. Thus it will be seen that both the medical and engineering craft are engaged in one and the same calling except that their studies are devoted to the physical sciences and ours to the science of applied mechanics

Proof of Prosperity.

THE WAR IS NOT depressing industrial conditions to the extent that might have been expected; certainly not to the extent that the public generally supposes. Some factories have closed, others are

running on short time. The great majority of industrial plants, however, are running along "as usual" and some, as a matter of fact, have experienced an acceleration of activity as a result of the war. On the whole there is no foundation whatever for the pessimism expressed so openly in many quarters or for the fears unexpressed perhaps, but nevertheless influencing operations, that all business men more or less feel.

The Farmer's Advantage.

FURTHER EVIDENCE of the possibilities of Canadian producers at the present time is to be found in the latest Weekly Report from the Trade and Commerce Department at Ottawa. It deals in part with the interrupted exports of Germany to the United Kingdom which amount to a considerable sum every year, and which must be supplied by other countries.

For the year ending December 31, 1912, the United Kingdom imported from Germany no less than 2,043,387 pounds, sterling, worth of live stock, grain and corn, none of which will be received until at least hostilities discontinue. This means some \$10,000,000 worth that must be secured by the United Kingdom elsewhere. Of this amount more than \$40,000 were paid for horses; over \$2,000,000 worth of barley was bought, more than \$3,000,000 worth of oats, \$1,000,000 worth of peas, \$2,000,000 worth of rye, \$650,000 worth of wheat, as well as flour, beans and other grains.

During the same period Germany sold the United Kingdom large quantities of flax, fish, pears, plums and raw hides, the latter amounting almost a million dollars.

Then in provisions it is shown that Germany was a big seller in a number of lines. More than \$500,000 worth of butter was purchased from her in the year mentioned, a million dollars worth of eggs, and quantities of hams and other meats. The total amount in everything during the year was no less than 70,048,152 pounds sterling, or more than \$350,000,000 worth. Some of this trade must come to Canada.

These figures further demonstrate the importance of the farmer and producer during the great conflict now waging in Europe. The markets of the United Kingdom are open to Canada and the fact that Germany's export trade is bottled up should mean better

prices for practically everything the tiller of the soil produces.

Reasons for Optimism

IN A WIRE to the MacLean Publishing Co., T. A. Crerar, president of the Grain Growers Grain Co.,—a company that handles more wheat in the West than any two or three other companies—says that the yield is found to be better in some districts than was expected, and indications from latest information were for a yield in wheat of from 150,000,000 to 160,000,000 bushels.

With the high prices prevailing, this means that the farmers of the West will get more for their crop this year than last.

News from all over Canada indicates that the farmers have before them a year of unprecedented advantages because of the demand for practically everything they produce. Horses, cattle, hogs, sheep, and all kinds of grain are higher in price than a year ago, and the majority of them are very much beyond last year's figures. While these advantages are being dearly bought by the blood of men engaged in war on the battlefield, nevertheless this has not been brought about by the actions of the farmers of this country.

The fact that the farmers are prospering, taken into consideration with the successful turn in the tide of battle against militarism of Europe, is one great reason why optimism is gradually replacing the feelings of doubt that followed on the heels of the declaration of war. Canadian merchants, both wholesalers and retailers, as well as manufacturers, have a duty to perform in propagating this spirit of optimism.

The Sanitary Engineer's Advantage

IT WILL BE seen by the above facts that farmers will have more money than any other class. They will require greater comforts in the home if they are to be brought up to the highest state of efficiency. They will want to know how greater efficiency may be created and will therefore be willing listeners to all or any person who can show them how greater results may be attained with the least amount of labor power. No class of men can save as much money for the farmer as can the sanitary and heating engineer and certainly no other mechanic can give the farmer greater home comforts and sanitary conveniences. Another phase which must not be lost sight of is that by giving to the farmer and rural resident all the comforts of the city dweller, the sanitary and heating engineer is doing much to stay the great tide of young folks who, after visiting a city, decide that country life has not the comforts of the city home. Many a couple have migrated from the farm, left a calling for which they were well-fitted and started life in a city, only to swell the great crowd of laborers who barely eke out a living during several months of the year. Then if they do return to the farm, they do not seem to have any interest in their occupation. We strongly urge sanitary engineers to cater more than ever to the rural residents, seeing that farmers and agriculturists are about to receive good prices for their products and that these products are the actual necessities of life both in times of peace as in war.

More Wheat; More Trade

MUCH HAS been written about the new openings for Canadian manufacturers, and considerable has been accomplished already. Not so much prominence has been attached to the openings before the Canadian agriculturist but substantial advances have been made in this direction, also along lines that will exert an important up-building power upon Canada's prosperity next year. The ravaging of the crops and the enormous numbers of non-productive war laborers that must be fed in Europe with few left to till the soil, has thrown upon Canada not so much a burden, as one of the best business propositions that ever came before her. "Grow more wheat for Europe" has been the advice from all quarters, and happily it has been heeded. A report issued by the Ontario Department of Agriculture, at the end of October estimated the seeding of fall wheat at over 1,700,000 acres, compared with 727,400 acres, one year ago, or more than double, and the yield for 1914 itself was estimated at 15,000,000 bushels. At least one-third of the pasture acreage has been sown with fall wheat and the Minister declared that the response of the farmers had been "magnificent," and if conditions were favorable, Ontario would have a crop the like of which she had "never before contemplated."

Saskatchewan reports a large increase in the acreage, and Nova Scotian farmers are heeding Premier Murray's appeal for next spring, while reports from other provinces are quite encouraging. With prices of wheat certain to remain high the proceeds of these big crops will mean padded bank accounts for the farmers, and business will reap its share of the benefit.

Editorial Comments

SANITARY AND heating engineers do not need to worry about capturing Germany's trade.

* * *

RATHER SHOULD they capture trade which is to be found in every rural residence or farm.

* * *

AND IN THAT way arrest the infectious germ which abounds in and around most rural homes.

* * *

SUCH A course would not only bring splendid profits but would also be a creditable move.

* * *

THE SANITARY engineer has a mission to perform in showing every person living in the country that cleanliness is next to godliness.

* * *

AND TO BE godly one must be healthy.

* * *

THEREFORE, get after the germ of filth, which is lurking around the country residences and assist in the building up of a sanitary home.

Bends and Offsets for Rectangular Pipe

Sheet Metal Problem Showing How to Make Bends and Offsets for Rectangular Pipe, Also the Regular End Joints.

Written for Sanitary Engineer by E. Bronson.

THE problems which we will consider here are bends and offsets in connection with square or rectangular pipe, and also a couple of the regular end joints for same. In laying out an offset, the same or similar to the one shown in Fig. 1, the angle and height are, of course, to be governed by the conditions which are to be overcome in the course of putting up of pipe. Care should be taken to see that the center piece of pipe is of the correct width, and not narrowed down. In Fig. 2 we show an elbow for square pipe. This elbow, as shown, is square in the throat, while the back has been rounded off to a quarter circle in profile.

In Fig. 3 we show an elbow somewhat similar, but with both throat and back cut off on an angle, making it appear like a three-pieced elbow.

To mark out pattern for the offset in Fig. 1, it is first necessary to draw an elevation of the end or side of pipe with offset and height required.

In Fig. 1 let A-B-C-D be the elevation

of the one required. While this shows the end or narrow way of the pipe, the method is the same if the offset be on the width of the pipe.

Draw a line as E-F, from E-F draw G-H a distance away equal to the width of the pipe required. Draw a line square with E-F at, say, E-G. From E and G mark off a space equal to C-1 on elevation from point 1. This obtained, mark off a space equal to 1-2 on elevation; from 2 mark off a space equal to 2-A on elevation. Connect points A-A, completing pattern of side on line A-2-1-C. To obtain pattern of opposite side, draw two lines, as K-L and M-N, a distance apart equal to width of pipe required; draw a line square with K-L to, say, at K-M; from K and M mark off a space equal to D-3 on elevation; from point 3 mark off a space equal to 3 to 4 on elevation; from 4 mark off a space equal to 4-B on elevation. Connect B-B, making pattern on line B-4-3-D of elevation complete. That the elevation is the pattern of the ends is, of course, understood.

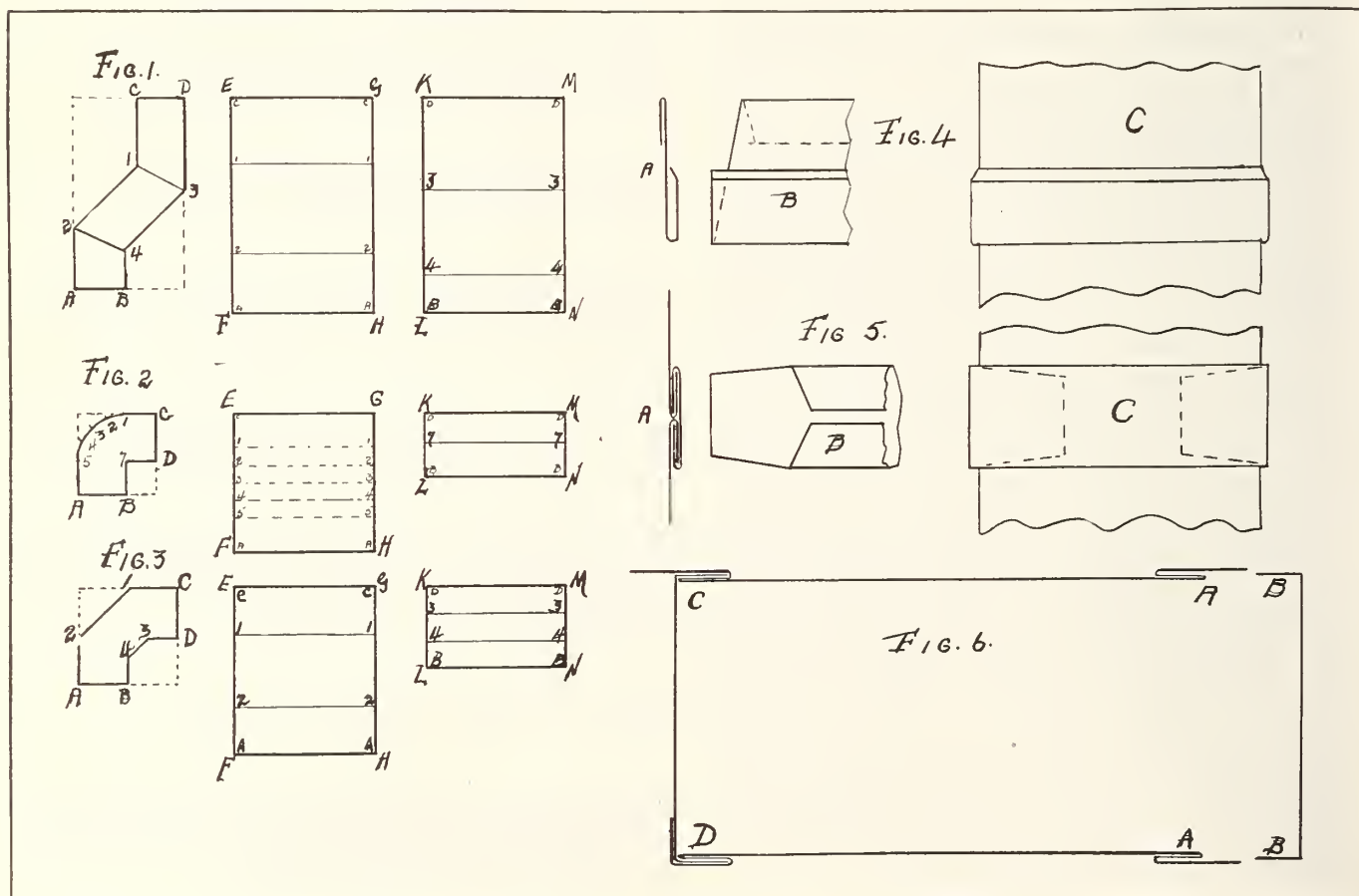
In Fig. 2 divide the circular back of

elbow into a number of equal parts, as shown by 1-2-3-4-5.

Draw two lines, as E-F and G-H, a distance apart equal to the width of the required pipe. Square from E-F, draw a line at, say, E-G from E and G; mark off a space equal to C-1 on the elevation. From this point 1 mark off the four spaces on rounded part of elbow, as shown by 2-3-4-5; from 5 mark off a distance equal to 5-A on the elevation. Connect points A-A, completing pattern of wide side on line B-C of elevation. Draw two lines, as K-L and M-N, a distance apart equal to width required; square from K-L; draw a line as, say, K-M; from K and M mark off a space equal to D-7 on elevation; from 7 mark off a distance equal to 7-B on elevation. Connect points B-B, completing pattern of wide side of pipe on line B-7-D of elevation.

The method of drawing pattern of elbow, shown in Fig. 3, is the same as described in Fig. 1. In each case the elevation is pattern of end, and the num-

(Continued on page 25.)



Practical Course for Sheet Metal Workers

Article No. 4 of Series

By CHARLES SEIVERS

FIG. 1.

In Fig. 1, two problems are shown of very much the same character. At A the problem is:—To draw a line parallel to a given straight line, and at a given distance from it. In this case let A-B be the given straight line and X-X the given distance.

In A-B, take any two points as C and D, and from these points erect lines at right angles to A-B, as shown by C-E and D-F.

With C and D as centres and with a radius equal to X-X draw arcs to cut the lines C-E and D-F. Connect these points, the line drawn through these points will then be parallel to line A-B.

Second Method.

At B, the problem is: To draw a line parallel to a given line, and to pass through a given point. In this case let A-B be the given line and C the point through which the line is to pass.

With the point C as a centre, strike an arc to cut A-B, as at D, with D as a centre and D-C as a radius, strike an arc to cut A-B at F.

With D as a centre and F-C as a radius, strike an arc cutting the arc drawn from D, a line drawn from this point C to E will be parallel to A-B.

In Fig. 2, two methods of doing the problem are shown, viz.: To divide a given line into any number of equal parts.

In the first method let A-B be the given line, draw C-D parallel to it at any distance.

On C-D set off C-1-2-3, etc., as many times as the number of spaces required. Draw a line through C-A and B-D meeting at E.

From points 1-2-3-4-5 draw lines to E cutting A-B. The points where these lines cut A-B divide it into equal parts.

Second Method

In the second method let A-B be the given line, from one end at A, draw a line as shown at A-C and at an angle to A-B, on this line, set off at any convenient distance, and as many times as the number of divisions required.

From the last of these points being 6 draw a line to B. From the other points 1-2-3-4-5 draw lines parallel to 6-B. Where these meet A-B they will divide it into equal parts.

Fig. 3.

To divide a given line, into parts which will have a given ratio.

In this case it is required to divide A B into two parts which will bear to one another the ratio of 3 to 7.

Draw C D parallel to A B at any convenient distance from it. On C-D set off from C any convenient distance 3 times from C to G and 7 times from G to D. Next draw lines through C-A and D-B meeting at E. Then draw a line from E to the 3rd space at G. It will then be seen that A-F and F-B bear to each other the same ratio as C-G and G-D viz., of 3 to 7.

Fig. 4.

On a given line, at a given point, to construct an angle, equal to a given angle.

In this case let A-B-C be the given angle, F-G the given line and G the given point. With B as a centre and any convenient radius, draw an arc to cut A-B in E and B-C in D. With the same radius and with G as a centre draw an arc to cut F-G at K.

Then with K as a centre and D-E as a radius, draw an arc to cut the arc drawn from K at L, and through L draw a line from G. The angle F-G-H is equal to the angle A-B-C.

BENDS AND OFFSETS FOR RECTANGULAR PIPE.

(Continued from page 24.)

bers and letters on drawings are the same, so that the problem can be followed out.

In Fig. 4 is shown the cleat joint, which is usually used on square pipe.

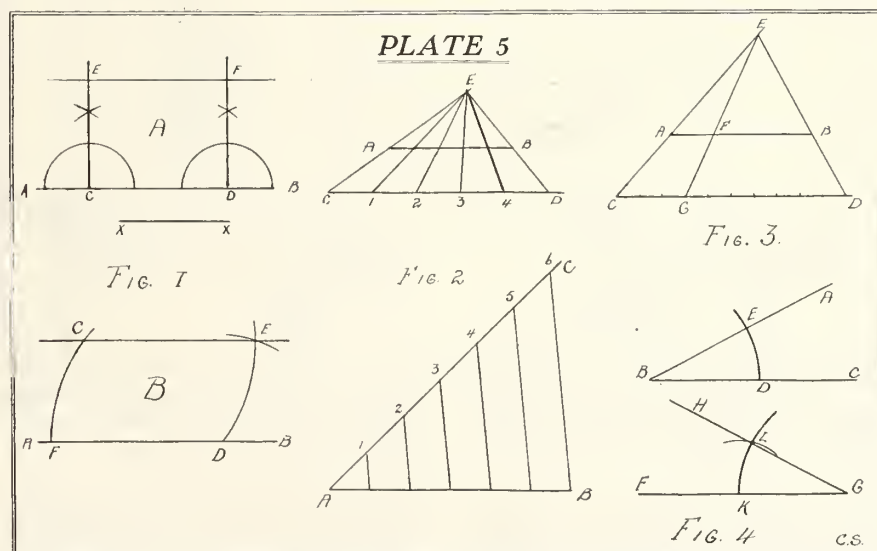
At A is shown a section through the cleat. At B a part elevation of cleat shown the end cut to allow pipes to enter one another, and at C a section of pipe with a cleat joint.

In Fig. 5 is shown what might be called a locked jointed cleat. At A is shown a part section of one side of two pipes, with edges or folds turned back on the pipe, and the cleat in place over and locked into them. At B is shown a part elevation of a locked cleat with lays on end. At C is shown a section of pipe locked jointed with this cleat, dotted lines showing the lays under the ends of cleats.

In Fig. 6 is shown a joint used either on the corners of square pipes or elbows and angles, etc. At A is shown the double fold. At B the single fold or edge which fits into the double fold. At C is shown the single edge entered into the double fold, and at D the joint complete.

This style of lock is handy for large square pipe and for the elbows. In using this joint for elbows or offsets, the single edge at B is put on ends, as shown by A-B-C and D in elevations at Figs. 1, 2 and 3, and the double fold on the straight sections of the patterns.

Remember that rolling stones gather no moss.



In developing the above problems we suggest that the student make his drawings four times the size of the above sketch.

Domestic Hot Water Supply Problems

A Series of Articles Dealing With the Problem of Hot Water Supplies, Range Boiler Connections, in Several Forms and Methods Adopted as a Means of Heating Water Under Various Conditions.

IN OUR last issue we discussed the trouble which is often experienced in heaters and waterfronts from lime depositing on the inner walls of pipes, etc. There is also another source of trouble which is found in districts where marshy water is used, and in cases where rain water too is used for general domestic use. Such matter will deposit in pipes and forms a shiny substance. It will also settle in the bottom of range boilers. This trouble can be overcome to some extent by placing a very fine brass, or copper screen about 60 mesh over each rain water leader, in the form of a box, about 6 inches x 10 inches deep, all screen except the top wired edge. These screens should be given some little attention. Every sanitary and heating engineer will agree with us when we state that every means known, should be resorted to to prevent this objectionable slimy sediment from accumulating in the range boiler, because, it does not take very long these days to cause a leak in a range boiler, the bottoms of which are so shaped, that it is an impossibility to drain the sediment out of the bottom.

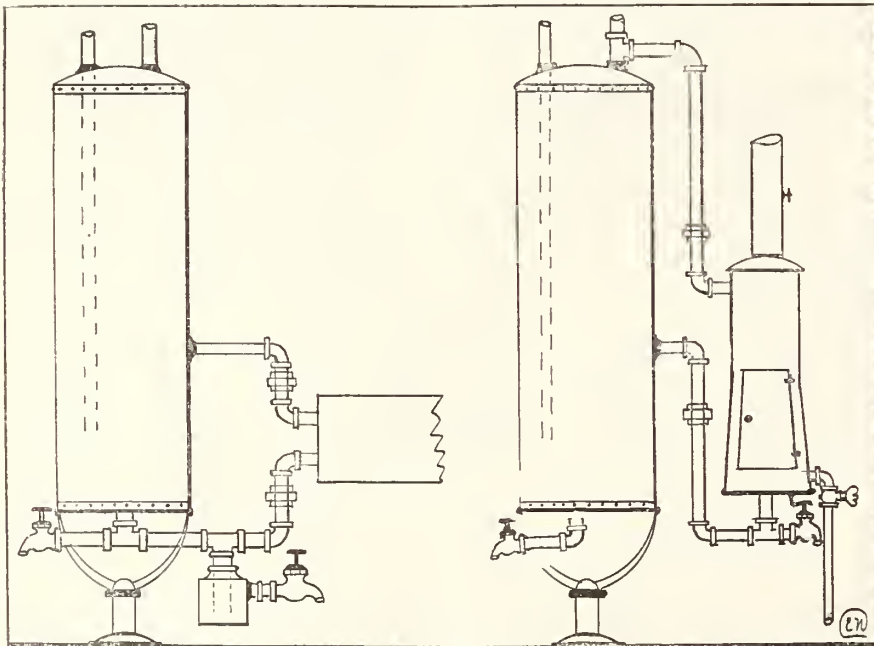


Fig. 1 showing sedimentation chamber connected to range connection to prevent stopping up of piping.

There are also various methods of collecting sediment to some extent, which are to be commended. Fig. 1 shows a sedimentation chamber which may be

inserted as shown in the bottom pipe of the range connection. This should be connected by using a bullhead tee and boiler coupling, so that a short tube can project down about half way into the chamber. A hose bibb should be placed at the top as shown so as to allow flushing.

This chamber can be built up of fittings, if desired. Again referring to hard water, where a slimy deposit is the trouble nothing less than 1 inch connections should be used, and in both cases where lime as well as earthy slime is the trouble as few elbows as possible should be used. Rather use tees, and crosses, with plugs screwed in the spare outlets. When a gas heater is used and it is feared that certain deposits may interfere with circulation, the heater may be connected as shown in Fig. 2, and when such a connection is made it is good practice to keep the heater as low down as possible. The bottom pipe should be one size larger than the coil in the heater, and further there should be a drain cock placed in bottom of boiler. as shown in Fig. 2. Of course you cannot expect to get as good results as if

Fig. 2 shows how gas heater may be connected, which will prevent slime or mud from collecting on coil.

the heater were connected to the bottom of the boiler, but as we said before, there will be no danger with the coil in the heater becoming clogged up.

The sanitary and heating engineer also impresses upon the householder the importance of using this tap placed at the bottom of the boiler as often as possible.

This tap if extended a little past the boiler side, and at a height suitable to allow a pail being placed under it should be a boon to every householder, as it would eliminate the necessity of placing the pail in the sink and having to lift it down. It would also prevent a deposit from accumulating in the bottom of the boiler. Sanitary engineers would do well to spend a little time educating their customers in such subjects and they would be surprised to see how their customers would appreciate the advice given.

(Continued in next issue.)

HEATING AND VENTILATION, PAST, PRESENT AND FUTURE.

(Continued from page 19.)

the return valve. However, all those troubles should be over at this date. When one looks back at the crudeness of the then up-to-date steam jobs, one cannot help but realize the great strides of progress which the science of heating has made these past ten years or so. One great field of business for the heating engineer exists in those buildings which have an old style 2-pipe steam installed.

Many of these systems are well laid out, but have the old style feed and return globe valves at each radiator or in some case coil. The heating engineer, by considering carefully the merits of the many new radiator specialties, could easily create new as well as make a lasting friend of the owner. The writer well recalls an instance when even such a simple matter as packing valves, captured an order for several hundred dollars' worth of repair work, but good spiral packing was used and the old cotton wick taken out. This particular incident happened exactly eight years ago and the packing is to-day as good as the day it was put in.

(Continued in next issue.)

Moved Quarters.

The Standard Plumbing Co., Lethbridge — S. Knapman, manager — has moved to 322 Sixth Street S., opposite the Herald.

No selling argument is stronger than its weakest part.

NEW CANADIAN PATENTS

Austin Berry, Warden, Quebec, Canada, 10th February, 1914; 6 years. Filed 6th November, 1913. Receipt No. 230,885.

Claim.—1. The combination with a water closet, of a hopper comprising a body having inwardly sloping sides, an inlet pipe engaging with the soil pipe of the water closet, and an outlet pipe, a door suitably hinged in the inlet pipe beneath said soil pipe and designed to open inwardly into the hopper, means of operating the inlet door, a door hinged in the outlet pipe and designed to open out-

ably hinged in the inlet pipe beneath said soil pipe and designed to open inwardly into the hopper, by means of operating the inlet door, a door hinged in the outlet pipe and designed to open outwardly, a water pipe let into and around the upper side of the hopper having perforations on the circumference next the hopper side, a valve connected at one end to the water pipe and at the other end to a reservoir, a steam pipe led into and around the sides of the hopper, means of simultaneously operating the water valve and the outlet door, as and for the purpose specified.

* * *

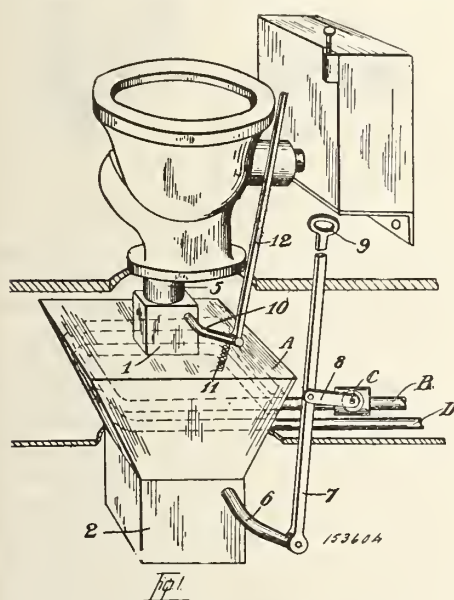
No. 153,647.

Edward L. Kellan, Chicago, Illinois, U.S.A., 10th February, 1914; 6 years. Filed 3rd November, 1913. Receipt No. 230,760.

Claim.—1. A flushing valve comprising a casing having a valve seat, a main, counter-balanced valve on the inlet side of said seat having a passage extending therethrough, a relief valve normally closing said passage, a stem for said relief valve extending through said passage and provided with a shoulder for opening said main valve, a closed liquid containing cylinder at one side of said casing, a piston in said cylinder having means restricting the passage of liquid therethrough in one direction, one of said piston and cylinder elements being fixed and the other manually shiftable, a restoring spring for said shiftable element, a shaft extending through said valve casing on the discharge side of said valve seat, a crank arm on said shaft engaging said relief valve stem, an arm on said shaft, said arm being external with respect to said casing and said cylinder, and a link connecting the same to said manually shiftable element, substantially as described.

2. A flushing valve comprising a casing having a valve seat, with an inlet port above the seat and a discharge port below the same, a removable cap closing the upper end of said valve casing, an upwardly opening main valve on the inlet of said seat having a hollow stem and a piston-like part restricting the passage of water from said inlet port to the upper portion of said valve casing, an upwardly opening relief valve controlling the flow of water from the upper portion of said valve casing to the discharge side of said valve seat, a stem for said relief valve extending through the hollow stem of said main valve and having a shoulder below the latter for opening the same, a shaft journaled in

the wall of said casing below said valve seat, a crank arm on the inner end of said shaft and engaging the lower end of said relief valve stem to shift both of said valves in opposite directions, a closed liquid containing cylinder at one side of said valve casing, a piston in said cylinder having means for restricting the passage of liquid therethrough in one direction, one of said piston and cylinder elements being fixed and the other manually shiftable, a restoring spring for said movable element, a crank arm on the outer end of said shaft,

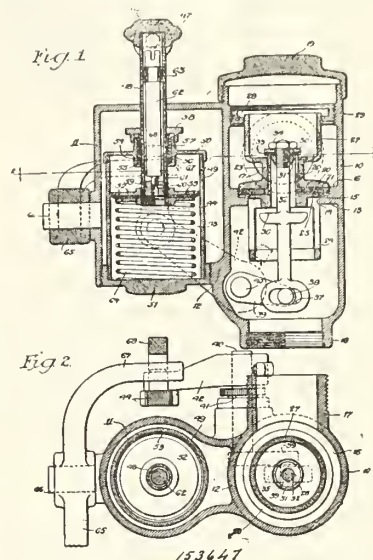


Water Closet for Railways.

wardly, and means of simultaneously operating the outlet door and flushing the hopper, as and for the purposes specified.

2. The combination with a water closet, of a hopper comprising a body having inwardly sloping sides, an inlet pipe engaging with the soil pipe, and an outlet pipe, a door suitably hinged in the outlet pipe beneath said soil pipe and designed to open inwardly into the hopper means of operating the inlet door, a door hinged in the outlet pipe and designed to open outwardly, a water pipe led into and around the upper side of the hopper having perforations on the circumference next the hopper side, a valve connected at one end to the water pipe and at the other end to a reservoir, and means of simultaneously operating the water valve and outlet door, as and for the purpose specified.

3. The combination with a water closet, of a hopper comprising a body having inwardly sloping sides, an inlet pipe engaging with the soil pipe of the water closet, and an outlet pipe, a door suit-

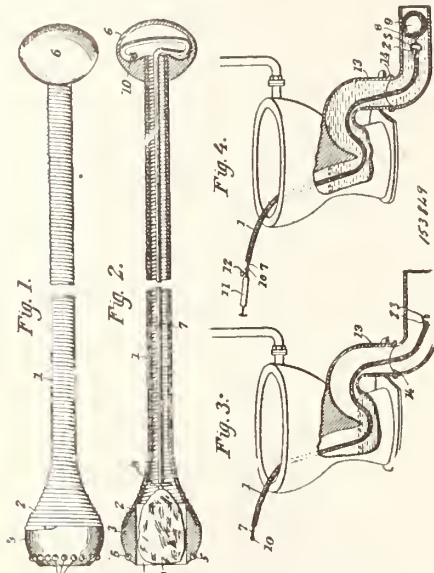


No. 153,647. Flushing Valve.

and connections between said crank arm and said manually shiftable element, said arm and said connections being external with respect to said cylinder, substantially as described.

3. A flushing valve comprising a vertical cylindrical casing having a valve seat, a laterally opening inlet pipe above said valve seat, and a downwardly opening discharge pipe below the same, a removable cap closing the upper end of said valve casing, an upwardly opening main valve on the inlet side of said valve seat having a hollow stem and a piston-like part restricting the passage of water from said inlet pipe to the upper end of said valve casing, an upwardly opening relief valve controlling the flow of water from the upper portion of said valve casing to the discharge side of said valve seat, a stem for said relief valve extending through the hollow stem of said main valve and having a shoulder for opening said main valve, a shaft journaled in the wall of said casing below said valve seat, a crank arm on the inner end of said shaft having a pin and slot connection with the lower end of

said relief valve stem, a closed liquid containing cylinder at one side of said casing, a piston in said cylinder having means restricting the passage of liquid therethrough in one direction, one of said piston and cylinder elements being



Plumbing Testing Device.

fixed and the other manually shiftable, a restoring spring for said shiftable element, a crank arm on the outer end of said shaft, said arm being external with respect to said casing and said cylinder, and a link connecting said crank arm to said manually shiftable element, substantially as described.

No. 153,849.

Herbert F. Shade, Victoria, British Columbia, Canada, 17th February, 1914; 6 years. Filed 12th June 1913. Receipts No. 225,574.

Claim.—1. A testing appliance including a flexible rod-like handle member and an inflatable sealing member movable longitudinally with respect to the handle member.

2. A testing appliance including a flexible handle member, a guide member carried thereby, and an inflatable sealing member adapted to be projected beyond the guide member.

3. A testing appliance including a flexible handle member, a guide member carried thereby, an inflatable sealing member adapted to be projected beyond the guide member, said sealing member being normally housed within the guide member, in deflected condition.

4. A testing appliance including a flexible rod-like handle member, a guide member carried by one end thereof, an inflatable sealing member normally housed within the guide member, and a

2. A valve comprising a casting having a tube in communication with the sealing member and housed within the handle member.

5. A testing appliance including a flexible rod-like handle member, a guide

member carried by one end thereof, an inflatable sealing member normally housed within the guide member, a tube in communication with the sealing member and housed within the handle member, and a ball bearing guide carried by and projecting beyond the outer surface of the guide member.

6. A testing appliance including a flexible rod-like handle member, a guide member carried by one end thereof, an inflatable sealing member normally housed within the guide member, a tube in communication with the sealing member and housed within the handle member, a hollow member carried by one end of the handle member and serving to house the end of the tube therein.

7. A testing appliance including a flexible rod-like handle member, a guide member carried by one end thereof, an inflatable sealing member normally housed within the guide member, a tube in communication with the sealing member and housed within the handle member, and means for connection to the tube to inflate the sealing member.

No. 154,300.

Henry Cejanus Brown, Brooklyn, New York, U.S.A., 10th March, 1914; 6 years. Filed 8th September, 1913. Receipt No. 228,708.

Claim.—1. A valve comprising a casing having a rounded seat, a spindle mounted for movement through the seat, a valve proper mounted for pivotal movement with respect to said seat and

Fig. 1.

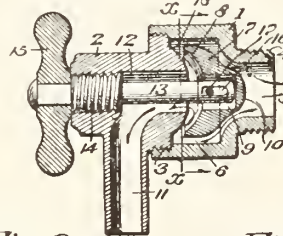


Fig. 2.

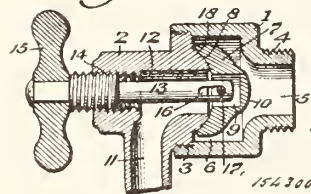
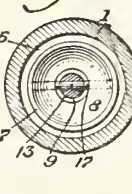


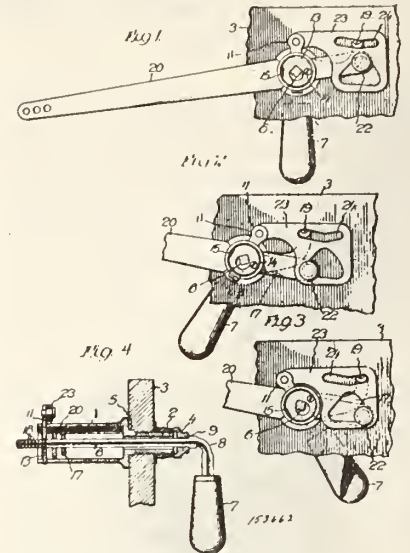
Fig. 3.



No. 154,300. Faucet.

having an incavated face adapted to close against the seat, and means connecting the spindle with the valve proper whereby the said parts are constrained to rotate in unison with each other but may move longitudinally of the spindle independently of each other. ing a rounded seat, a spindle having a slot at one end mounted for movement through the seat, a valve proper mounted for pivotal movement with respect to said seat and having an incavated face

adapted to close against said seat and having a recess to receive the end of the spindle, and a pin secured to the valve proper and passing through said slot and capable of movement therein longitudinally of said spindle whereby said



Flush Valve Mechanism.

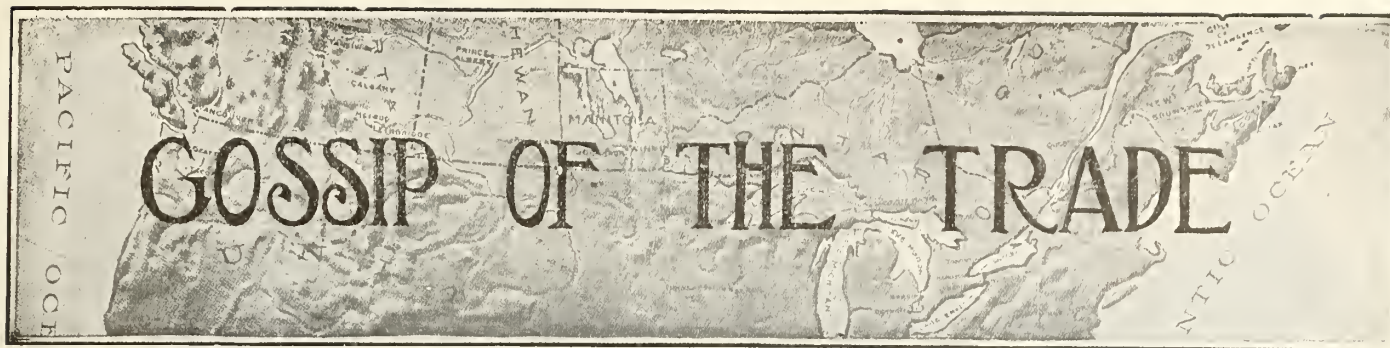
valve and spindle rotate in unison but are capable of relative movement longitudinally of the spindle independently of each other.

3. A valve comprising a casing having a rounded seat, a valve proper having an incavated face adapted to close against said seat and its opposite face exposed to the incoming liquid, said valve proper having a recess in its incavated face, a spindle mounted for movement through said seat and having its end adapted to shut against the rear wall of said recess to move the valve proper away from said seat, said spindle having a slot longitudinally there of near one end, and a pin passing through said slot and secured to said valve whereby the valve proper and stem are capable of relative pivotal and longitudinal movement but are constrained to rotate in unison.

No. 153,662.

John W. Meaker, Detroit, Michigan, U. S. A., 10th February, 1914; 6 years. Filed 3rd December, 1913. Receipt No. 231,889.

Claim.—1. Mechanism for operating a flushing tank valve comprising a sleeve adapted to be secured to the inner face of a tank wall in an opening there-through and provided with transverse guide slots near the inner end, a rock arm member oscillating in the sleeve and in a slot thereof, a valve operating lever oscillating the sleeve and slots thereof, a manually operable spindle extending through the sleeve and engaging the rock arm member, and means articulating the rock arm member to the lever to move the latter to open position when the spindle is turned in either direction.



Wanted—A Gasoline Separator.

Now that the mayor of the City of New York has placed his veto upon the measure which would have repealed the ordinance making compulsory the equipment of public garages with what have come to be known as oil separators, attention naturally will centre upon these devices if for no other reason than because the garage men have so consistently fought against them upon the grounds that they will not prevent gasoline and oil from entering the sewers, which is their purpose. Notwithstanding numerous sewer explosions, it is claimed that the quantity of gasoline that finds its way into the sewers is so small that the separators of which there are several types, will not serve their purpose. If this is so, it would seem that there is ample room for the exercise of genius in the evolution of a device which really will separate the oil and gasoline from the water and hold it.—Scientific American.

Commenting upon above, we are not sure whether a gasoline separator is needed more than proper ventilation of main sewers. We do not think that users of gasoline are apt to allow gasoline in any great quantity to leak into drains or sewers, but, in case there is a certain quantity enters, all danger can be overcome by eliminating the main house trap and breather, and having perforated main hole covers, thus allowing a free flow of air up through the soil and vent pipe stack of every building.

Change of Property at Cookshire.

Mr. H. Casavant, of Ascot, Que., has purchased Mr. H. Lalumiere's property on Pleasant street and intends to open a bakery here. Price paid, \$2,500. Mr. Lalumiere, who is a plumber and tinsmith by trade, recently purchased the farm known as "the forty-acre field," and intends to move onto the same shortly. Together with farming he will carry on his trade, doing way with repair work.

THE SEA CALLS.

Mr. C. H. Armstrong, who for the past two years has conducted the busi-

ness of plumbing, domestic and sanitary engineer, has decided to leave Estevan for San Francisco, where he will take a position as engineer on one of the excursion steamers plying from that port. Mr. Armstrong has had previous experience in the mercantile marine, and he finds the call of the sea as strong as ever.

INCENTIVES.

I should be sorry for myself if no one seemed to care at all

While watching me attempt to climb, or feared that I might slip and fall;

I should not have the heart to try my strength again if I believed

That no one would be gladdened by each little triumph I achieved.

I should be sorry for myself if no one watched me jealously,

Or secretly was glad to see the obstacles confronting me ;

I should not have the will to dare, my efforts would be few and small,

If I could be assured that there were none who wished to see me fall.

—S. E. Kiser.

HEATING AND VENTILATING OF OUR HOMES.

Continued from page 17.

engineers have not paid enough attention to this problem. The public are looking for all kinds of contrivances which will improve the health, not only would they be interested, but without doubt would consider such a problem as humidity. About seven years ago the writer was doing some work in a house and noticed that nearly every person living in the house was suffering from dry irritating coughs. The lady of the house would insist upon having the temperature very high, which was almost unbearable to the rest of the occupants. It was just about this season of the year too. It was suggested that water pans be placed behind the radiators. The lady demurred. However, to prove the efficiency of pans, it was decided to get some cloths folded several thicknesses, wet them thoroughly, and place them over every radiator.

This was done for several days. Then one morning a nice order was given for a copper pan to fit each radiator. To-day there is no coughing in that house, the temperature is lower, and the whole of the occupants are in every way more healthy. This particular order brought more in its train.

There is no doubt about it, and if sanitary and heating engineers would devote a little more study to such problems they would be rendering a service to their customers which would be very much appreciated. When a new heating system is being tendered for, this subject should be mentioned and all particulars should be given as to cost of the necessary appliances. The customer should be shown that humidity is just as essential as heating.

A practical illustration of this is the fact that we can sit and read in comfort on our verandahs in a temperature of from 60 to 65, having a normal humidity; while the same temperature in our homes, with a dry atmosphere, would be very uncomfortable, owing to the more rapid evaporation of moisture from the surface of our bodies in the drier atmosphere.

Obviously, then, whatever the method of heating may be, it is imperative that provision be made for having the air sufficiently charged with moisture.

Book on Smoke Test.

The James Morrison Brass Mfg. Co., Ltd., Adelaide street, west, Toronto, are issuing a very interesting booklet entitled "The Smoke Test," or "How to test plumbing," by T. N. Thomson, S.E. Every subscriber to The Sanitary Engineer should read this little booklet. Write to the above mentioned firm and procure one.

Farm Houses Equal City's.

"A farm home offers advantages that cannot be had in town or city at any price. They are advantages that go far toward making a wholesome and a happy life. Until recently town and city life afforded certain physical comforts which were not to be had in the farm home,

and the absence of which detracted greatly from the attractiveness of farm life.

"These were the advantages and comforts that go with furnace heat, water-works, and sewer systems. But recent developments now make it possible to have these advantages in the country home at no greater expense than in the city home. So now country life holds out all of the advantages, with none of the disadvantages of city and town life."

The above note appeared in a recent issue of the "Toronto Telegram." It goes to prove what "The Sanitary Engineer" has been preaching for some years. It is astounding how little the residents of our rural districts know of the comforts they may enjoy, by having their homes equipped with sanitary and heating engineering.

Sanitary and heating engineers have an opportunity second to none at their very door, as it were. They do not require to discuss the war and the problem of waging war against Germany's trade. Germany has made less inroad upon the business of the craft than upon any other line of business.

Never was there such an opportunity given to sanitary and heating engineers as now. The ordinary city building trade is at a standstill, and is not likely to revive until long after the war is over, and all the work which can be expected by sanitary and heating engineers is that of repairing. The sooner the trade launch out and try to get business from the rural resident the better for the whole trade, both employer and employee. Never was there such a genuine need for the resident in rural districts to become more acquainted with problems of sanitation than to-day. The farmer is cultivating more soil, is sowing more grain, and will get a better price from the results of his labor than ever before. He will either be investing his surplus cash or he will be depositing it in the bank at 3 per cent. Further, if the farmer is going to launch out, as we know he must, he should, in all fairness to himself and family, become acquainted with the good things he may enjoy. Problems of sanitary and heating engineering were not solved for the exclusive benefit of the city dweller; therefore, it is the bounden duty of every sanitary and heating engineer to enlighten the farmer. It is a responsibility which lays at the door of every member of the craft. If the medical faculty, after finding out a cure for some dread disease, were to keep the remedy to themselves, they would only be doing what 90 per cent. of the sanitary and heating engineers are doing to-day. We venture to assert that not 10 per cent. of those engaged in the trade have ever asked a farmer for an order.

TEN COMMANDMENTS OF MAIL ORDER HOUSES.

The following ten commandments are offered by one philosopher, for the guidance of catalogue house patrons:

1. You shall sell your farm produce for cash, whenever you can, but not to us. We do not buy from you.

2. You shall believe our statements and buy all you need from us because we want to be good to you although we are not acquainted with you.

3. You shall send the money in advance to give us a chance to get the goods from the factory with your money. Meanwhile you will have to wait patiently a few weeks as that is our business method.

4. You shall buy church bells and church fixtures from us and forward the money in advance for this is our business method and you shall collect from the business men in your town as much money as you can for the benefit of your churches as it is against our rules to donate for building country churches.

6. You shall buy your tools from us and be your own mechanic in order to drive the mechanics from your vicinity, for we wish it so.

7. You shall induce your neighbors to buy everything from us as we have room for more money—less money there is in your community the sooner we can put your local merchants out of business and charge you what we please.

8. You shall look often at the beautiful pictures in our catalogues, your wishes will increase and so you will send in a big order although you are in no immediate need of the goods otherwise you might have some money left to buy some necessary goods from your local merchant.

9. You shall have the merchants who repair your goods you buy from us book the bills so you can send the money for their labor to us for new goods, otherwise they will not notice our influence.

10. You shall in case of sickness or need apply to your local dealer for aid and credit as we don't know you nor do we care to.

AN IMPROVING SITUATION.

The American Metal Market (New York) says editorially:

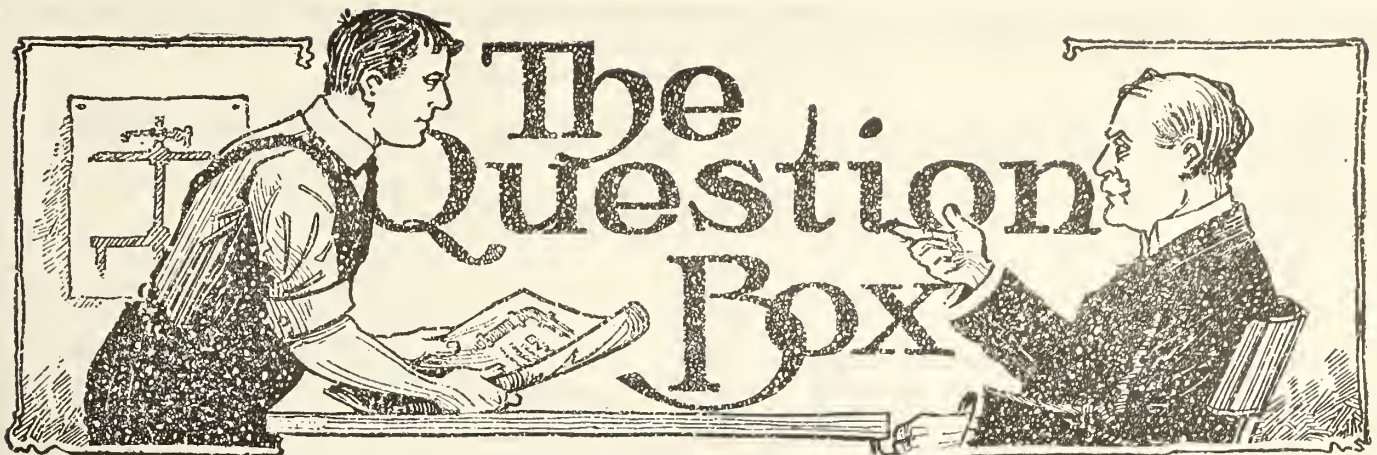
There is a decided improvement in the financial situation. For the first time since the war commenced the New York banks are able to show an actual surplus in reserves, and a reduction in outstanding circulation, which indicates that emergency currency is being retired, and war time expedients less necessary. Again the Secretary of the Treasury has announced the Federal reserve banks will be launched November 16th. This will release, it is estimated, close to \$400,000,000 in reserves that under the old system our banks have had to carry. But more important than all, we think, is the decline of seven points in foreign exchange in the past seven days, exchange being at a price to-day where gold shipments cannot be demanded. It does seem that at last things are beginning to return to normal conditions in the financial and money world.

Business to-day throughout the country is probably more depressed, and slack than at any time, and the falling off in the production of commodities, especially iron and steel, is sensational. It took some weeks for business to appreciate the seriousness of what happened in the first week of August. Most of us did not realize what an awful collapse in credit and the financial machinery of the world took place at that time. It is wonderful that what has followed has not been more serious in its effect on business, but it has been bad enough. Now we can see daylight, and while it is not yet shown in any revival in operations, the minds who direct and control these operations are easier, their courage and confidence is returning, and it will be illustrated, we feel confident, in increased operations before long. A great change for the better is seen in the tone of the metal trade, as the readers of our reports for the past week have noted. Some trades have been thrown into activity in the past week through the placing of large orders for foreign war requirements, and with the war likely to be continued for some time, these orders can be expected to continue and probably increase. Given a return to something approaching normal financial machinery and foreign exchange conditions, we will be able to reap some of the advantages of our situation, and a market for our manufactures and commodities that Europe from her awful condition of war cannot provide, but yet must have.

Patience is a plaster for all sores.

* * *

There are none so blind as those who will not see.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

How to Lay Tile Pipes on Hill Side.

Editor The Sanitary Engineer:

I have been very much interested in the various articles dealing with sewage disposal plants and septic tanks for use in rural districts, but would like to ask you if you can show how the field tile pipes should be laid when the house is situated upon a hillside. Could you also show a drawing and describe how the various joints should be made?

An Interested Reader.

This question, no doubt, will be of interest to more than our inquirer; therefore, we will show how this system of piping should be laid. In the first place, the ground may require some slight grading, so as to make a satisfac-

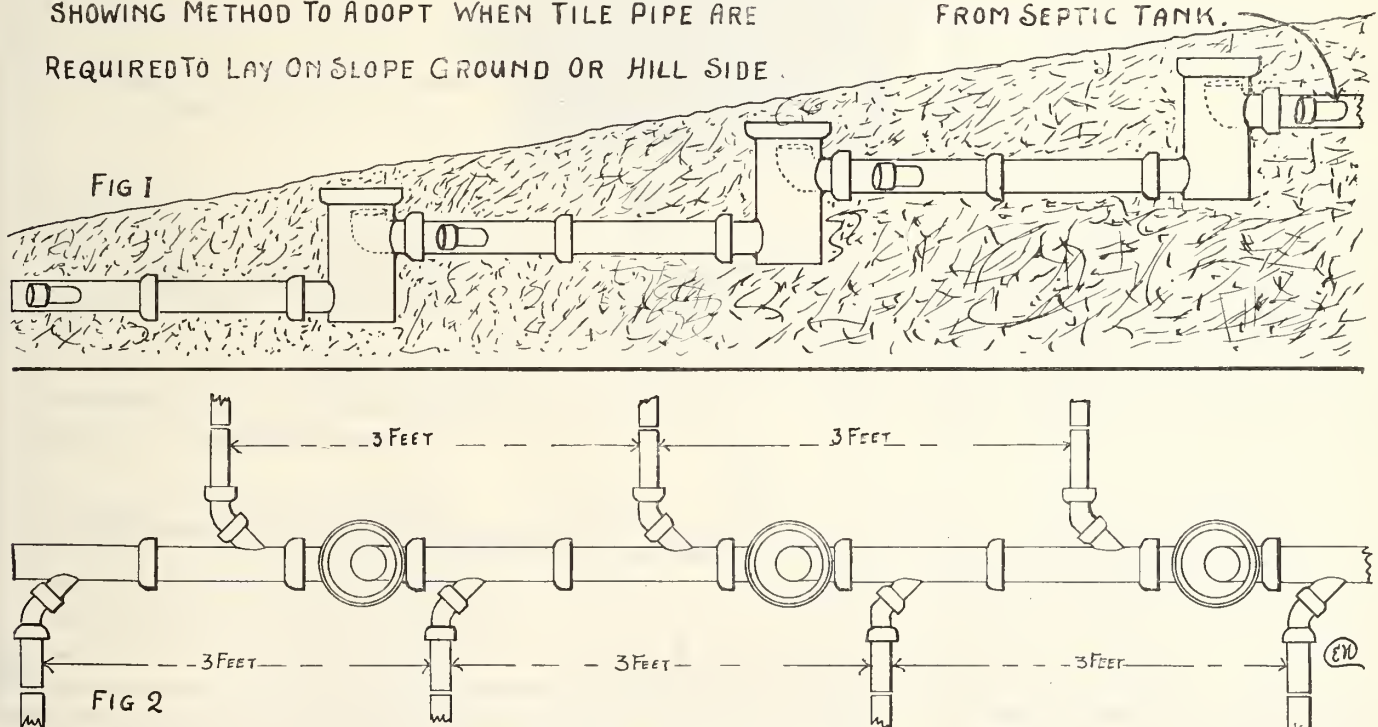
tory installation, and care should be taken to have good earth to lay the tiles on. Figs. 1 and 2 show how the tiles may be laid. The main pipe which leads from the tank should be vitrified and each joint made tight; then the field tile or irrigation pipes laid, as in the ordinary system. Each branch of pipes should not be more than 12 or 14 inches below the ground, and in a case like this the system could be greatly improved by laying a few inches of gas coke under the pipe, as well as over, when the ground is of a clayey nature. Six inches of coke at least should be all round the pipe, and the trenches should be two feet deep and two feet wide, to allow for the coke.

Fig. 3 shows a special vitrified tile fit-

ting, which has been specially designed by the writer for this purpose. It will be seen that the upturned bend is required, so as to prevent the fluid from following the line of least resistance and filling the lower reaches of pipe first. In fact, if the bend were not placed in such a position, the force of the liquid would be sufficient to flood the ground, and percolate through it to the surface; but by using the bend, the fluid is, as it were, trapped, until the irrigation tiles are filled, or nearly so. The fitting shown in Fig. 3 can be made as shown in elevation, Fig. 1, with a bottom and outlet, but when so required, care should be taken that the proper measurements are given from centre of inlet at the bend to centre of outlet. They can be

SHOWING METHOD TO ADOPT WHEN TILE PIPE ARE
REQUIRED TO LAY ON SLOPE GROUND OR HILL SIDE.

FROM SEPTIC TANK.



Plan and elevation of septic tank piping on a hillside.

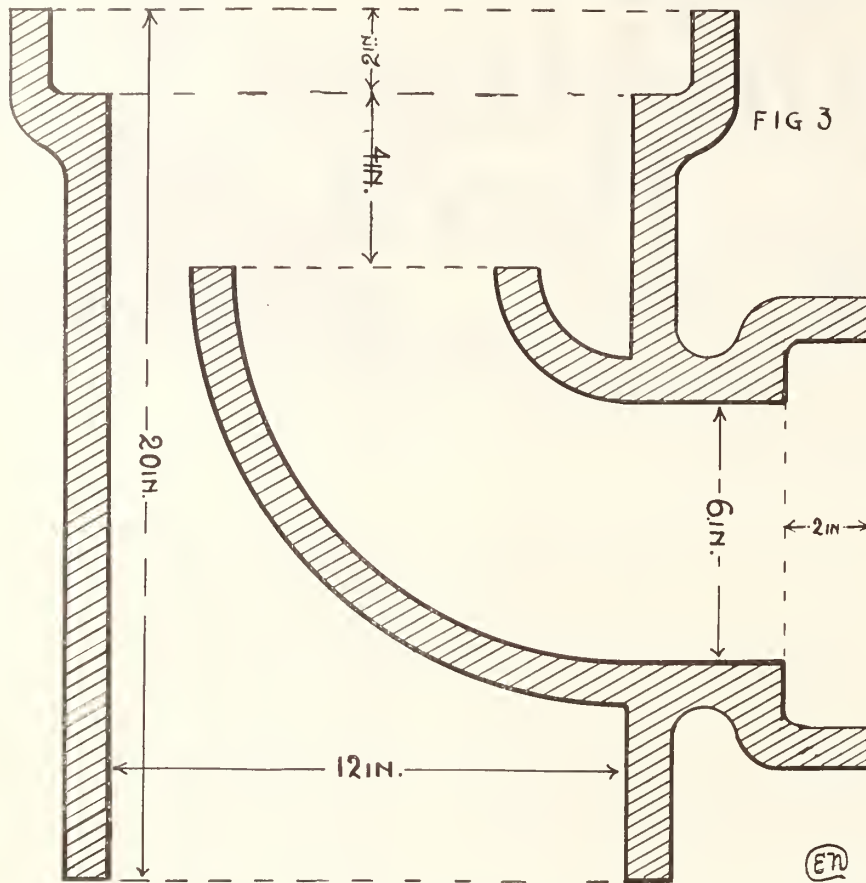
procured from the Dominion Sewer Pipe Co., Ltd., Swansea, near Toronto.—
Editor.

TROUBLE WITH SMOKY PIPE.
Editor The Sanitary Engineer:
I have installed a wood furnace, and it

damp, and there are four elbows on the smoke pipe. Can you suggest a remedy?
G. C.

The trouble which G. C. is having is a very common one. It can be very easily overcome. We are giving a sketch showing what should be done, as well as an explanation.

Although G. C. mentions that it is a wood furnace, the same trouble is often experienced with a coal furnace, particularly when long runs of piping are required so as to assist in heating. In the first place, if there is a long run between the collar on the furnace to the chimney, the pipes should be covered with corrugated asbestos paper. Next, all such pipes should be installed the reverse way to ordinary. Next, the elbows looking down, if they are built up as shown, should be soldered at the lower half of the joint (see Fig. 2), and every elbow looking horizontally should be replaced by using a capped tee, as shown in Fig. 3. The reason we advise that the joints of the pipes should be reversed is to allow any material to continue running down the interior of the pipe, which would otherwise leak out at every joint (see Figs. 4 and 5). While discussing this matter, we will deal with cases where it has been found advisable to lengthen a chimney by adding several lengths of iron pipe. These extensions are oftener than not installed upside down. They should always be riveted with the joints inserted downward, so as to prevent condensation resting on the joints and rusting away at rivets. If our readers will take notice of any old iron chimney stack which is being replaced, they will find that in 99 cases out of 100 the material is in the worst state of deterioration at the joints. The writer has



Vitrified clay fitting for use when pipes from a septic tank must be run on a hill-side or slope.

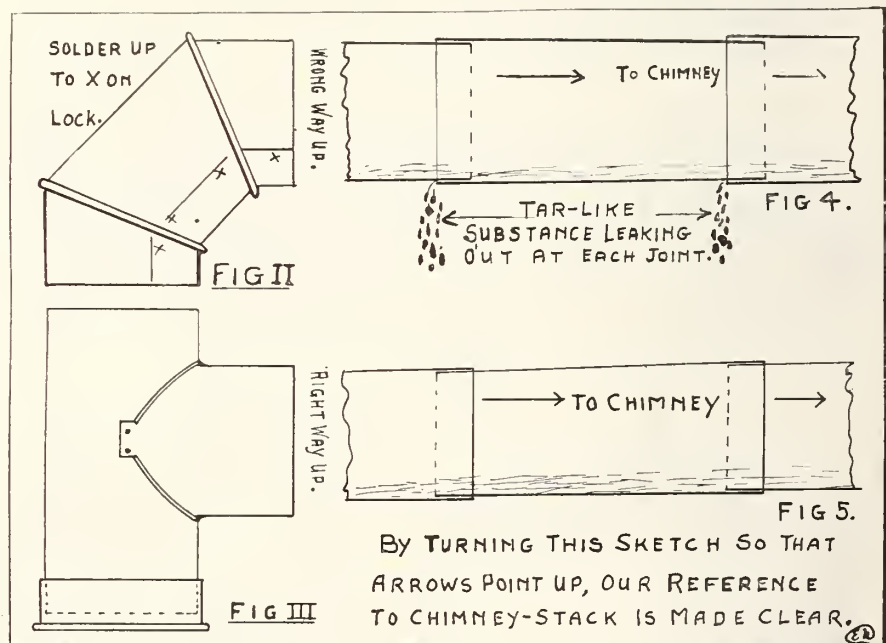
Is a Main House Trap and Breather Necessary?

Editor, The Sanitary Engineer:

Would you please inform me whether it is necessary to install a main house trap and fresh-air inlet to a system when every fixture in the building is trapped and vented?
Plumber.

We certainly do not think it is necessary. We are very sure on this point, and have had our opinion endorsed by scores of the most practical men in the country. The main house trap and breather question is a fetish of the past. It reminds us of the old story which is told of the bell-founder, who is said to have conceived the idea that to cast a bell, which would ring true, it was necessary to add the life blood of a virgin. Several times this founder failed to cast a good bell, because he could not get blood. At last his own daughter is said to have jumped into the furnace, unknown to her father, and the bell came out O.K. Sanitary engineers must take this question of the main house trap and breather more seriously and discontinue the practice. Simply because a lot of our plumbing by-laws demand them is no proof that they are necessary.—Editor.

runs creosote or some other tar-like material, which is a source of annoyance. I have put in 8-inch pipes instead of 7-inch, but there does not seem to be any improvement. The cellar is somewhat



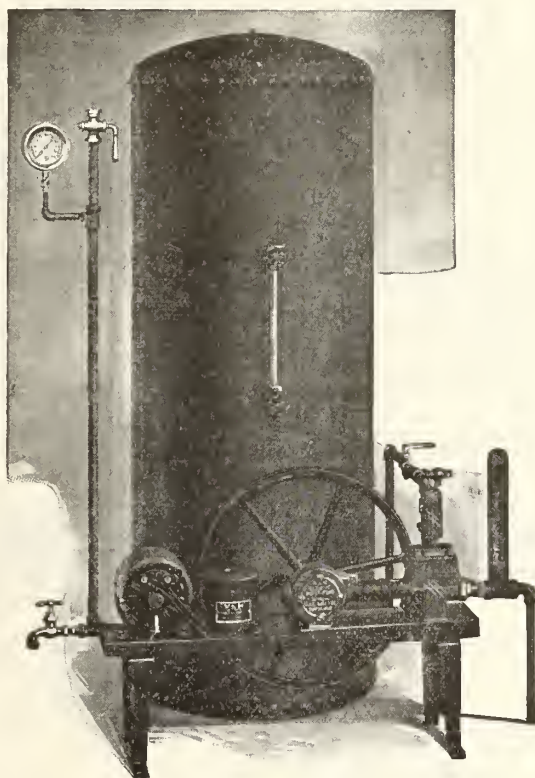
Showing method of installing Furnace Piping to avoid the trouble mentioned by our correspondent.

Have You Ever Looked to Your Surrounding Country Districts for Business?

Owing to the unfortunate war conditions in Europe the farmer is the most prosperous man in Canada to-day. He is getting more for his crops than he has for some previous years, and it is not only in your interest, but your duty, to see that this extra money going to him is kept in circulation.

Make him a visit to-day and show him the necessity of installing a complete water supply and sanitary system.

System No. B4, including tank, pressure gauge, water gauge, pump, electric motor and automatic switch, relief valve, $\frac{1}{2}$ -inch stop, $\frac{3}{4}$ -inch stop and waste, and $\frac{1}{2}$ -inch compression bibb tank, 30" x 6 feet



System No. B4

capacity — 220 gallons, vertical lift of pump 18 feet—will discharge to height of 75 feet and supply five ordinary house fixtures; pump automatically starts and stops by electric switch.

We have a large variety of outfits for every kind of domestic service, including hand, electric, water and power driven, deep and shallow well pumps. Write us for information and prices. We are sure that there is a large field for business open to you if you only go after it, and we wish to help and co-operate with you in every way possible.

Empire Manufacturing Co., Limited

LONDON, CANADA

MANUFACTURERS OF AND DEALERS IN
PLUMBERS' AND STEAMFITTERS' SUPPLIES OF ALL KINDS

rebuilt many a chimney by cutting off the material at the laps, bolting them up with stove bolts, and then added enough length to take up what has been cut off.
—Editor.

Why Will This Not Work.

Editor The Sanitary Engineer.—Enclosed please find sketch of heating boiler, which has been installed to heat a house containing between 450 and 500 sq. feet of radiation. It is a No. 4 New Idea; two 2½ inch mains run from the top to feed, and return to the base. On account of there being no headers on the furnace I tapped the top section as shown, so as to put three copper coil heaters to heat the system. This is quite a common practice in our city, and I have installed quite a number of jobs which have worked very nicely, but somehow in this case the job does not come up to my expectations.

Do you think it is because of connecting the top of the gas heaters to top section instead of the main feeds? This is the first time I have connected such heaters to a furnace without headers.

The boiler gives every satisfaction when coal is used, and when gas is used the feed gets very hot, but does not give the satisfaction I expected. Any information you can give me about the job by way of a remedy will be greatly appreciated.
D. R. H.

We have shown in Fig. 1 the sketch which D. R. H. submitted to us. It will be seen that the gas heaters are not likely to give as good satisfaction as if the

top pipe were connected to a header. Moreover, there are two heaters on one main and one on the other while the returns are connected at the boiler. The boiler in this case is a dead load upon the heaters. It is strange to us that the job works at all. When such heaters are connected up, they should be fitted up so as to work either jointly or separately. In the way D. R. H. has them connected it will be seen that if the heaters are not in use, they will be a dead load upon the furnace. We have shown in Fig. 2 how such a system should be worked. It will be seen that each side works independently. For instance, by placing a gate valve on each outlet top and bottom, it is possible to cut out the furnace altogether.

By so doing, one, two, or three or any number of heaters may be connected. It is not necessary to heat the whole body of water in the furnace, which is of no material use to the system, when not being used as the medium of heating. One thing which must be considered is the expansion pipe. If this pipe is connected direct to the furnace, it must be on the outside of the gate valve on the return. It will also be seen that two mains from the top of the boiler should be connected as shown. If the changes suggested in Fig. 2 are carried out there will be no further trouble.—Editor.

What Do the Letters B.T.U. or T.U. Mean?

Editor Sanitary Engineer.

Could you please inform me what the terms B.T.U. or T.U. mean? As my

schooling was very limited, I would like some plain definition free from highly technical terms.

An Inquirer and Reader.

The term B.T.U. is an abbreviation which stands for British Thermal Unit, and T.U. means Thermal Unit, both terms being one and the same.

In plain language, one B.T.U. is the amount of heat required to raise the temperature of 1 pound of water 1 degree Fahrenheit. Let us cite a practical example:—If we wish to raise the temperature of 20 pounds of water 40 degrees Fahrenheit, how many B.T.U.'s would be require?

Solution— $20 \times 40 = 800$ B.T.U.

Again, suppose we desired to know the number of T.U. there is in 1 pound of water at 75 degrees Fahrenheit how would be proceed?

We must begin at the temperature at which ice is melted. Ice is supposed to melt in water at 32 degrees above zero; therefore, if the temperature of the pound of water is 75 degrees, we must subtract 32 from 75, and the answer would be as follows:— $75 - 32 = 43$ T.U.—
Editor.

Self-praise is no recommendation.

* * *

The sleeping fox catches no poultry.

* * *

War or no war, the Christmas rush will soon be on us.

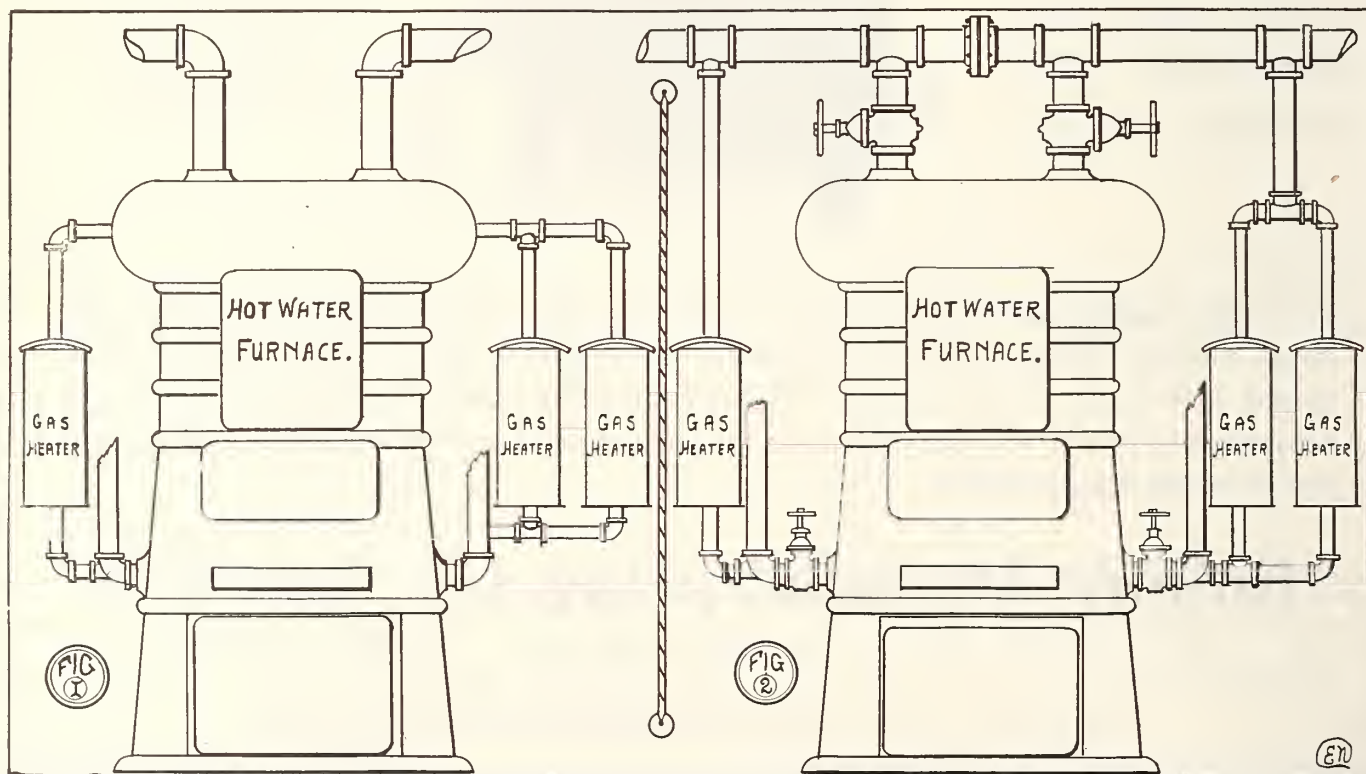
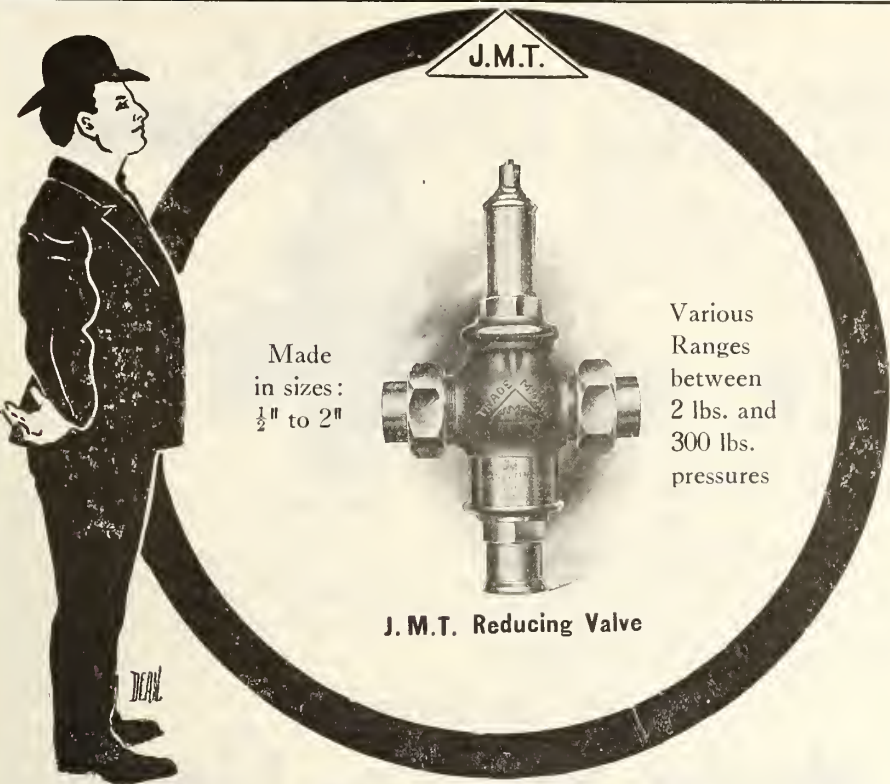


Fig. 1 shows sketch sent in by D. R. H. Fig. 2 is a suggestion which will be found to give every satisfaction.



Be Patriotic

Buy and Use Goods
"MADE IN CANADA"

The Non-Equalizing feature of the J. M. T. Reducing Valve (on account of there being no drip or exhaust) is unquestionably the main requirement of a Reducing Valve—and found only in the J. M. T. Reducing Valve.


Invaluable for use with steam heating systems, etc.

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The James Morrison Brass Manufacturing Co., Ltd.

Engineers' and Plumbers' Supplies 89-97 West Adelaide Street, TORONTO, ONTARIO

Our Mixed Metal Sales Amount to Over \$5,000,000 Annually



THE RESULT OF QUALITY

Babbitt Metal, Bar Solder, Wiping Solder, Wire Solder, Lead Pipe, Bar Lead, Traps, Bends, Copper, Tin and Antimony.


Let the goods prove their worthiness of a place in your stock. Send a trial order.

Hoyt Metal Co.,

New York, N. Y.; London, Eng.; St. Louis, Mo.

Toronto, Ont.

TORONTO



WINNIPEG

The absence of the cuts of our Winnipeg and Toronto plants does not indicate that we have been wiped out by the war—but—

MANUFACTURERS
OF
**CAST IRON
SOIL PIPE
AND
FITTINGS**

We are getting out a new illustrated price list and require the cuts. These price lists will be of interest to you. Write for one.

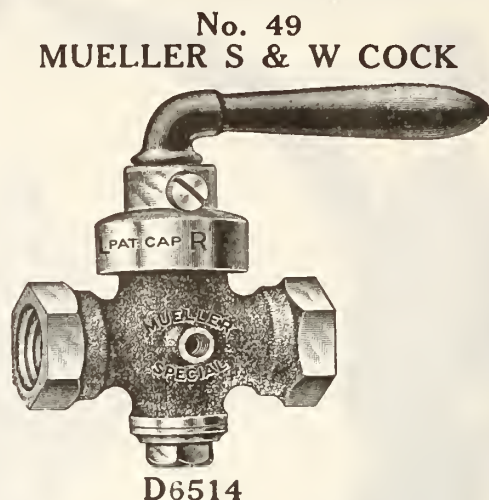
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This Cock Has Been On the Job a Long Time

And it has never fallen down in the performance of the work for which it was intended. Plumbers everywhere are sure of good and satisfactory installations when they use

MUELLER 49

Stop and Waste Cock



Mueller Ground Key work has every element of stability—good metal, good patterns, good workmanship and good grinding. And every element is proved up by our 200 lbs. hydraulic pressure test and UN-CONDITIONALLY GUARANTEED.

Made in Sarnia

H. Mueller Mfg. Co., Limited

SARNIA, ONTARIO

Makers of High-Grade Water, Plumbing and Gas Brass Goods.

H. Mueller
Mfg. Co., Ltd.
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Give me prices
on Mueller No. 49
S & W Cocks, and
send me complete
catalog.

Signed
City State

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will interest you

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The ordinary methods of trying to clean Water Closet Bowls by scouring and brushing or by the use of dangerous acid, fail to reach the worst place—the unseen trap or outlet. The trap becomes dirty and makes the water standing in the bowl foul and offensive.

No matter how much the bowl is scrubbed and brushed, it cannot be made clean and sanitary while the trap is untouched.

Sani-Flush

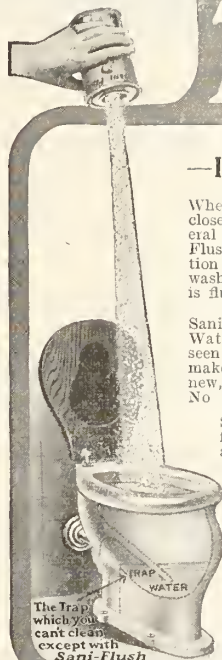
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When shaken into a water-closet bowl and left for several hours over night, Sani-Flush dissolves the incrustation in the trap, so that it washes out when the closet is flushed.

Sani-Flush cleans the entire Water Closet Bowl — the seen and unseen parts. It makes the bowl white as new, sanitary and odorless. No scrubbing is necessary.

SANI-FLUSH is perfectly safe to handle and use; cannot injure bowl or connections. Its frequent use insures a clean and sanitary Water Closet Bowl.

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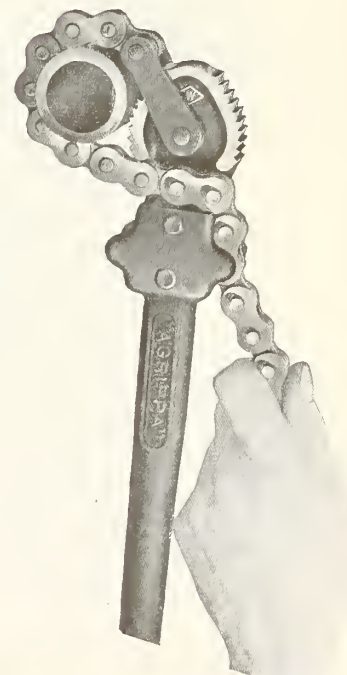
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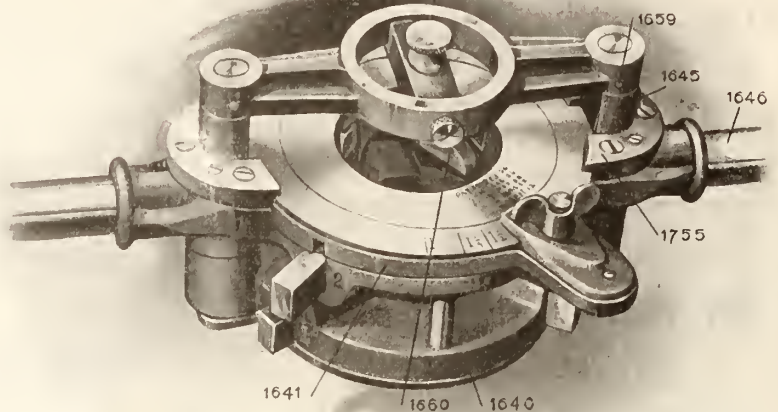
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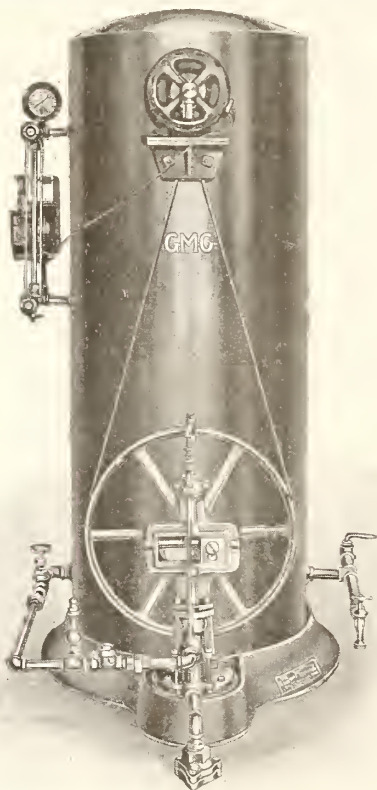
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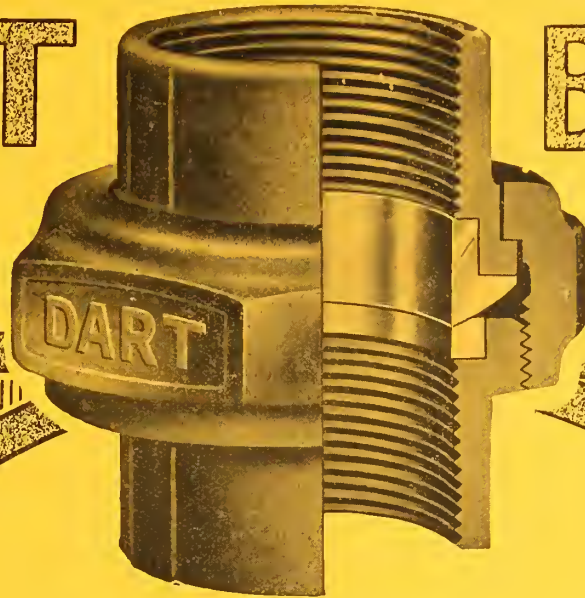
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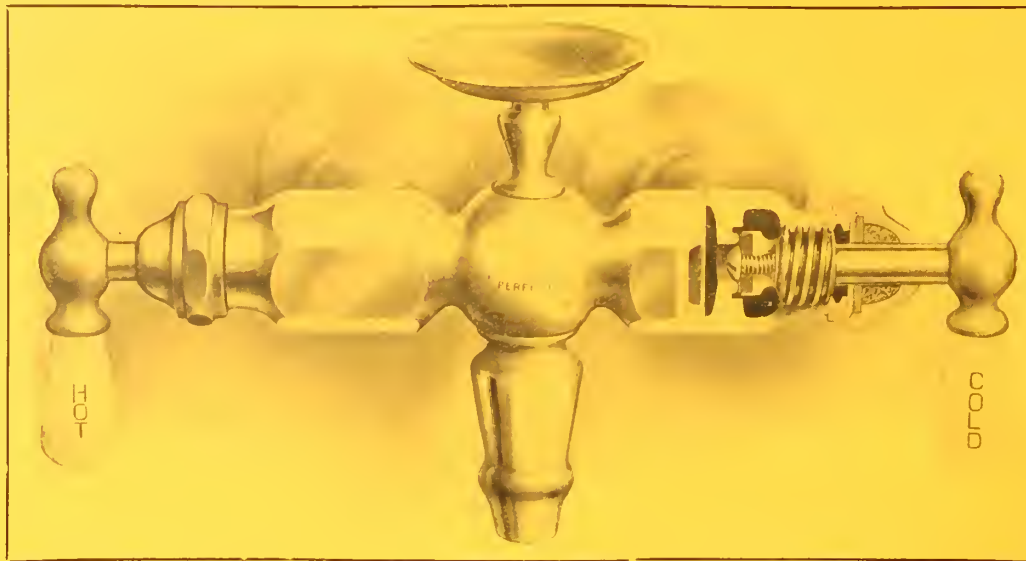
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THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

Publication Office : TORONTO, DECEMBER 1, 1914

No. 23

QUALITY

UNDER normal conditions, when the factories and mills are running to their full capacities, when the various pieces and parts are being "Ground out" in almost unlimited quantities and volume; in such times the demand invariably exceeds the supply by a large margin, hence, it is not altogether a question of what one might want or prefer—rather, to take whatever can be secured, in time, to serve the purpose, even if it isn't altogether "up to the mark."

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Attractiveness of Design, Finish and Durability.



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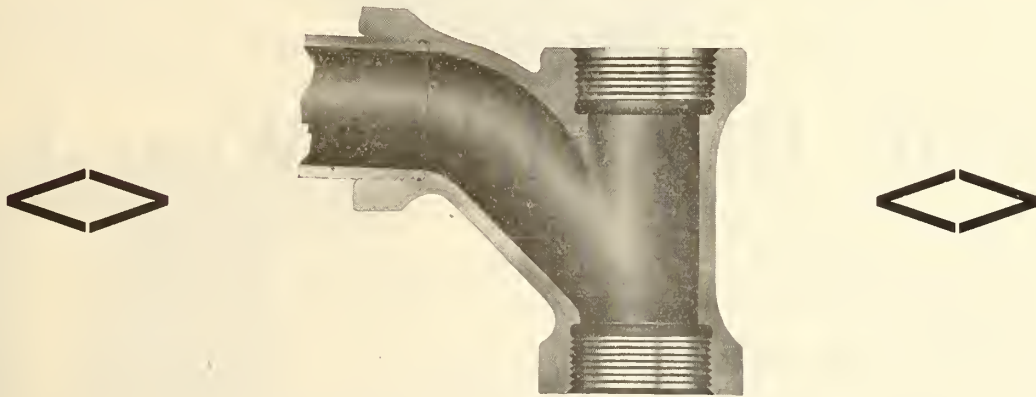
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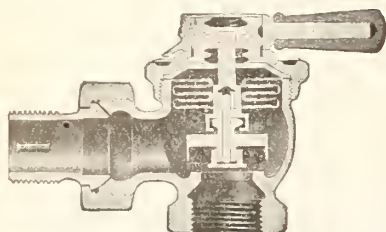
VAPOR HEATING—What It Is

Vapor Heating is heating with steam at very low pressure. Ever notice the steam that rises from a pan of boiling water? That is the vapor utilized in heating by the Dunham way.

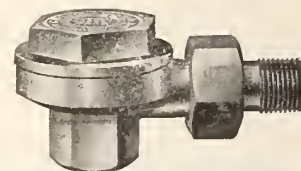
It has long been known that Vapor for the use of heating held great possibilities. Many attempts were made to utilize its heat, but all with little satisfaction, because of the methods and apparatus.

Like all other forms of heating it had to wait its turn for the rounding out into a perfect working system before it became practicable.

The Dunham Company with the experience gained in the field of larger heating plants and the successful manufacture of the Thermostatic Radiator Trap, after long experimental tests were ready to place on the market a system of real value in every respect—The Dunham Vapor System of Heating for Residences, Stores or Apartment Buildings.



By the application of the Dunham Packless Inlet Valve on the supply to and the Dunham Radiator Steam Trap on the return from, you have in each radiator a perfectly flexible and separate heating unit.



Electric Boiler Pressure control—positive in action and operating to maintain an even heat at low fuel cost.

Electric Temperature Control working in conjunction to maintain any desired temperature in the rooms.

You have—the Dunham System, the foreword in Vapor Heating.

A system doing away with troublesome air valves on the radiator. Working without noise or pounding. Circulating heat, throughout every radiator quickly and with only one or two ounces pressure on the boiler. Simple in the extreme, both in design, specialties and particularly operation.

It costs no more than the out-of-date. You should know more about it. Our Bulletin No. 11 will give the facts.

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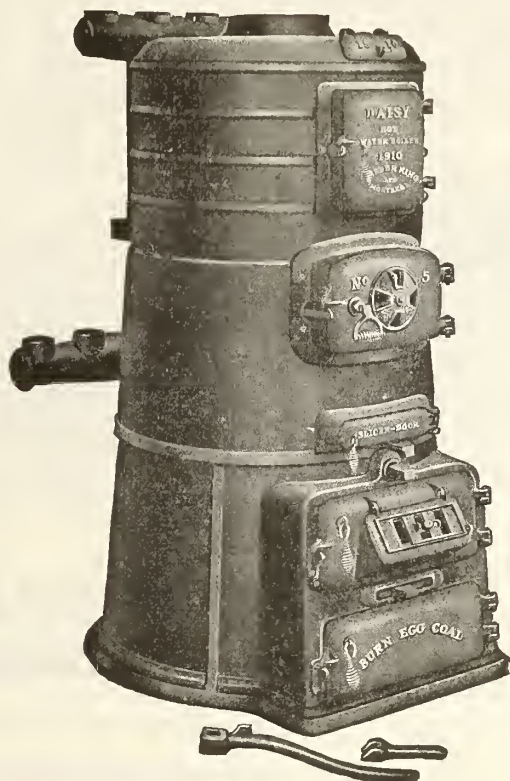
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Over 55,000 DAISY Boilers

are giving the best of service throughout Canada.

The Daisy has qualities which make it a better proposition than any other on the market.



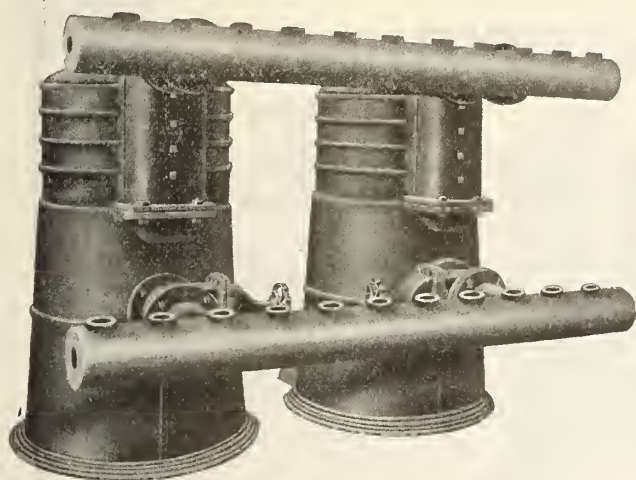
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Without doubt the most popular boiler made.

Every installation means another customer satisfied.

Minimum consumption of fuel.

Maximum amount of heat.



Rear view of two Daisy Boilers connected with twin headers. This system gives great satisfaction in mild and extreme weather.

WARDEN KING LIMITED, MONTREAL

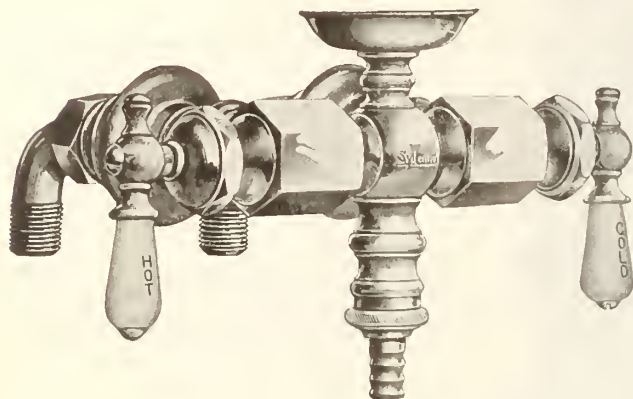
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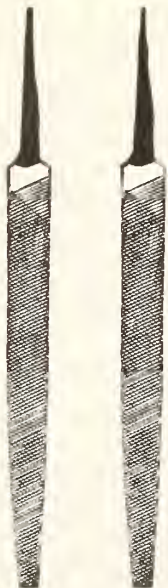
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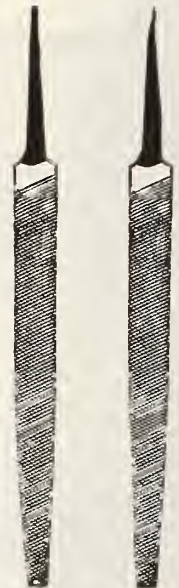
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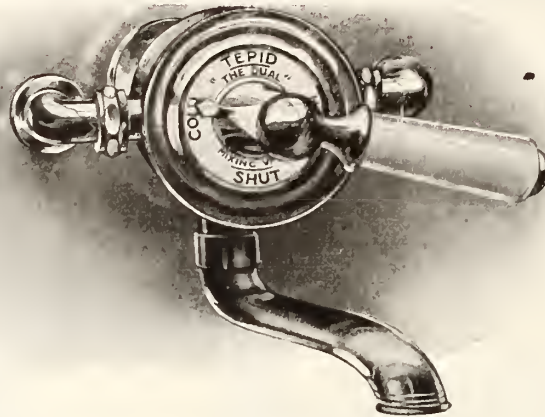
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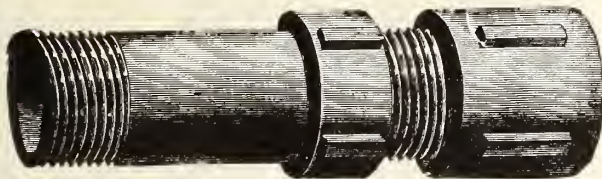
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PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, DECEMBER 1, 1914

No. 23

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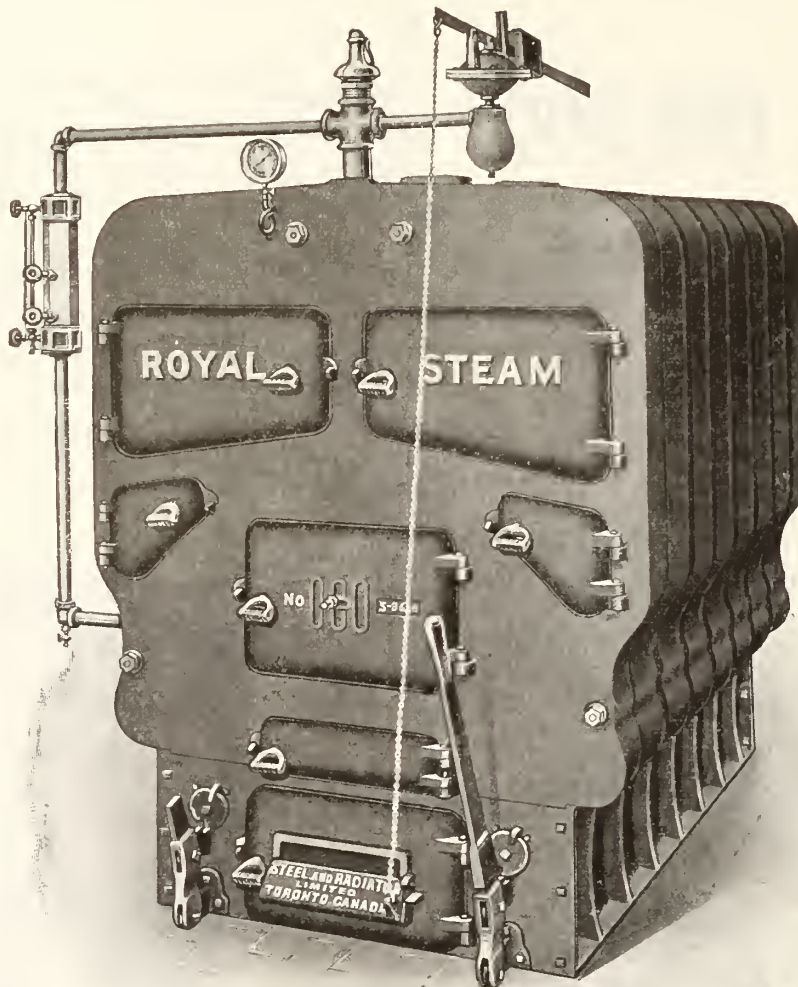
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VOL. VIII.

DECEMBER 1, 1914.

No. 23

Simplified Sanitary Engineering Methods

Showing That to Simplify the Construction of Piping is More to be Desired Than Multiplicity of Piping—The Latter Does Not Necessarily Increase the Efficiency.

By Dr. Wm. Paul Gerhard, S.E., New York.

THE late eminent sanitary engineer, Col. George E. Waring, Jr., speaks thus in his book "Sewerage and Land Drainage:"

My own conclusion on the subject of trap ventilation is that it is almost always unnecessary; that the means prescribed are not well suited to the end in view; that there is more liability of the destruction of the seal by evaporation by reason of the venting than of its destruction by siphonage when not vented; and that in those rare cases where siphonage cannot be prevented by a better arrangement of discharge pipes the best remedy would be to supply the defective traps at their summits with McClelland's mercury seal trap vents, a perfectly safe device of little cost, simple and easy of application, and sure to supply air when needed, because affording less resistance to its inflow than does the water of an S-trap of ordinary depth.

The class of traps which cannot be emptied by siphonage includes all that are of great depth and diameter, in addition to Putnam's traps described above. These large and deep traps are used chiefly in connection with water closets and they constitute an important element of the various forms of siphon closet.

In another recent volume, on "How to Drain a House," the same writer and expert discusses trap ventilation in the following words:

Devices intended to meet existing difficulties have not all been confined to the form and construction of the trap itself. Much the most widely recommended and successfully enforced effort to meet the difficulty has been to supply what is known as the "back-ventilation" of traps. Having known of the early failure of this device before it was generally recommended to the public, and taken up in the compulsory regulations of health boards, I have never been able to look upon it with favor. There is

no doubt that under many circumstances it does good, but I believe that, on the whole, it does more harm.

Not only as confirming my own view, but as an illustration of very thorough and careful experimental work, attention may properly be called to an investigation carried on for the City Board of Health of Boston, by J. Pickering Putnam, Esq., an architect of that city. These investigations have been set forth quite fully in illustrated communications to the American Architect, which papers certainly mark a very important step forward in sanitary literature. The deductions to be drawn from these investigations are these:

Whether compelled by local law to ventilate traps or not, I should not depend on ventilation, in the conviction that the simple S-trap, as ordinarily constructed and as ordinarily ventilated, is totally unreliable.

If compelled by law to construct the prescribed back-ventilation, I should be tempted after its completion, to make the system inoperative by closing the main ventilation pipe at some point near its upper end.

In the matter of trap ventilation and simplification of plumbing we owe much to the investigations and researches of Mr. J. Pickering Putnam, a Boston architect, to whose extended writings on the subject the reader is referred for further information. One of the outcomes of his studies and experiments was the invention of an anti-siphoning trap, the well-known Sanitas trap.

More recently, an important series of experiments on trap-siphonage were made in Germany, and as the conclusions reached have a bearing on the question under discussion, I give in the following a detailed account of the same.

*My translation of this valuable report was communicated first in the columns of the American Architect.

as reported by their author, Herr Unna, in a Germany sanitary periodical.*

The plumbing regulations of the City of Cologne, Germany, until recently required "back-air pipes" at the traps of fixtures for the purpose of aerating the branch wastes and preventing the loss of water seal by siphonage. A committee, appointed to revise the rules, entertained doubts about the necessity or propriety of this rule. Some members of the committee referred to one of the leading principles of house drainage, which requires the work to be carried out with as much simplicity as possible, and pointed out the fact that the "back-air pipes" tend to complicate the system and render it liable to leaks at the numerous additional pipe joints required. This fact cannot surprise us when we learn that the rules in Cologne permitted the use of galvanized sheet metal pipes for vent pipes, and that the joints sometimes were not even soldered. The committee argued in favor of simplifying the plumbing as this would materially reduce its cost. Incidentally we are informed that a thorough examination of a number of vent pipes attached to traps disclosed the fact that the vents were in nearly all cases entirely closed and stopped up by grease, coffee grounds or spider webs.

While some claimed that the use of back-air pipes should be retained, but that they should be of heavy lead or iron, others argued in favor of their omission, because siphonage of traps could not occur in ordinary cases.

To settle this important question authoritatively, the Municipal Building Department determined to have a series of experiments made. These were carried out jointly by Herr Maniewski, architect of the department, and Herr Unna, a sanitary engineer of Cologne. The experiments also gave incidentally, some very interesting information on the flow of water and air in house pipes.

On a board fence, about 10 metres (33 feet) high, and 8 metres (26 feet) wide, three platforms were erected representing three storeys of a building, each being 3 metres (9 ft. 9 in.) distant from the next (see Fig. 96). The pipes system used in the experiments was attached to the board fence with pipe bands. It consisted of a horizontal main sewer five inches in size, and of two vertical pipe lines, which in different experiments were made of different diameter, viz.: two, 2½, four and five inches. A gate-valve S was placed immediately above the junction of the first vertical pipe with the sewer. The first vertical line, a waste pipe of two inches diameter (changed to 2½ inches in some experiments), had three Y-branches as shown, and was extended full size above the top of the fence. On the lowest floor this pipe had an inclined branch waste pipe, with three Y-branches and fixtures, located at a distance of 1 metre (3 ft. 3 in.) from each other. The main sewer was continued, as shown, to the second vertical line, which was likewise extended upward in full size, and was made 2½ four and five inches in diameter successively. The unshaded portions, G, of the vertical and horizontal lines represent sections of full bore glass pipes, which were inserted for the purpose of making observations on the flow of water. The bowls and traps experimented upon were likewise manufactured in glass. All possible combinations of arrangement and dimensions occurring in actual practice, and the following points were considered in the experiments:

1. The inside diameter of the horizontal sewer.
2. The inside diameter of the vertical pipe lines.
3. The size of the waste connections of the bowls.
4. The depth of water seal in the traps.
5. The size of the strainers in the fixtures.
6. The distance of the fixtures from the vertical lines.
7. The grade or rate of inclination of the horizontal branches.
8. The influence due to enlargement, reduction and full closure of the upper ends of the vertical lines.
9. The possible modifications in the results due to the omission of the main trap.
10. The action and resistance of traps under fixtures connected with a vertical pipe line, through which large quantities of water flowed quickly and suddenly, corresponding to the carrying away of a heavy fall of rain through a roof conductor pipe, or the discharge of a bath-tub filled with water.

11. The resistance of water closet traps connected with a vertical soil pipe.

The observation of the flow of water and air by means of the sections of glass pipes inserted, established the fact that a solid water column or water piston was formed only in the case of inclined branch wastes when the top of the vertical lines was fully closed. In previous experiments, made by Herr Unna with glass models of small bore, the water poured through the bowls invariably formed into a piston and emptied the traps by siphonage.* With a soil pipe open at the top, water poured into a fixture, dashed against the opposite side of the vertical pipe, and at once broke up into single threads which assumed a spiral motion along the walls of the soil pipe (see Fig. 97). As the amount of water poured into the fixture was in-

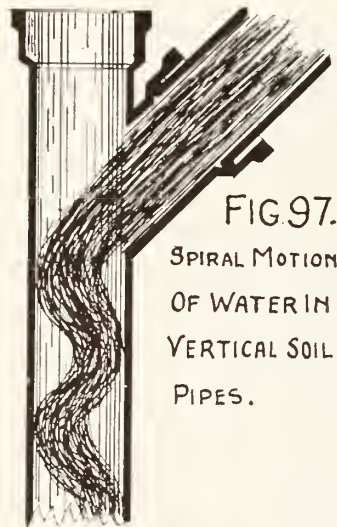


FIG. 97.
SPIRAL MOTION
OF WATER IN
VERTICAL SOIL
PIPES.

creased the number of threads of water increased from the circumference toward the centre of the pipe until finally the entire pipe was filled with threads of water. This breaking up of a solid body of water into a number of single films serves also to explain the large volumes of air drawn in by the water, for each thread carries some air along with it. In order to gain some knowledge as to the amount of air sucked in, an anemometer was placed at the mouth of the vertical pipe, the instrument being made of the same diameter as the pipe and fitting tightly into the same. It was found that the discharge of one bucket of water sucked in from 60-90 liters (2, 1-3.2 cubic feet) of air, according to the time consumed in pouring out the pail. With four pails discharged in rapid succession, nearly 500 liters (17¾ feet) of air were sucked in.

When water was poured in at the top

of the vertical soil pipe, it separated into vertical parallel threads. The aid measurements gave results which were about 50 per cent. smaller than in the case of the branch waste pipe, showing, as might be expected, that there is a stronger suction in the case of smaller vertical waste lines and of lateral branches. When an increaser was placed on the top of the vertical line, the results did not differ from those of a pipe line having a full sixe extension. When a fitting was inserted, which reduced the area of the pipe mouth 50 per cent. the threads, of the falling water became more concentrated, and the water in the adjoining traps became violently agitated and was often sucked out. When the top of the vertical line was closed entirely by a plug, the water did not break up into threads. In the larger vertical pipes the water flowed down along the sides of the pipe when it was poured out slowly through the fixture. When poured quickly, the water formed a solid piston and caused the siphonage of the traps.

The water flowing through the main horizontal sewer, instead of having a level surface, formed a concave surface (see Fig. 98). This may be explained by the friction of water along the sides of the pipes which causes here a slower velocity than in the centre. In the smaller horizontal waste pipe (two-inches diameter) the flow of water showed the same results, except that when large volumes of water were poured out, a piston of water formed which created a strong suction. By extending the waste pipe at its upper end vertically and keeping the pipe end open, the same results were obtained as in the case of the vertical main line.

The use of a main intercepting trap will necessarily modify the manner in which the flow of water and air in a pipe system takes place, and hence the experiments were made both without and with a trap in the main house sewer.

If the clean-out in the drain trap was omitted, and large volumes of water were poured through the soil pipe, the water in the trap welled up considerably and a strong outward current of air was perceptible, notwithstanding the fact that the first vertical waste line was open to the roof and thereby acted as a relief pipe. With a closed clean-out on the trap, the air current became sufficiently strong to force by back pressure traps with 40 mm. (1¾ inches) depth of seal. These experiments tend to show that the omission of the main trap favors a more regular flow of water through the pipe system.*

Another important question to deter-

*This shows conclusively the fallacy of making trap tests by means of small glass models.
W. P. G.

*The new plumbing regulations of the City of Cologne accordingly prohibit the use of a trap on the main drain.
W. P. G.

mine was how the self-cleansing properties of traps would be affected by an increased depth of seal, which renders traps less liable to siphonage, for it is obviously undesirable to use in practice traps which while resisting siphonage, are not self-cleansing.

To determine the maximum depth of seal at which traps would still be self-cleansing, experiments were made with glass traps of different diameters and of different depths of seal. These traps were entirely filled with mud and sand, and the bowl filled with water until a head of 40 centimeter (sixteen inches) had been reached. The effective area of the strainer was taken as equal to 50 per cent. of the area of the cross-section of the trap. The sand was flushed out by the water forcing its way first at the upper point of the lower trap bend (at a in Fig. 99). The result of these experiments are summarized as follows: Traps of $1\frac{3}{4}$ and two inches diameter are self-cleansing when they have a water-seal not exceeding 120 mm. or nearly $4\frac{3}{4}$ inches; and traps of $2\frac{1}{2}$ inches diameter are self-cleansing with a seal up to five inches in depth. But Herr Unna very properly calls attention to the fact that the experimental traps were made of glass, and therefore were smoother than lead, iron or brass traps; he accordingly assumes a seal of four

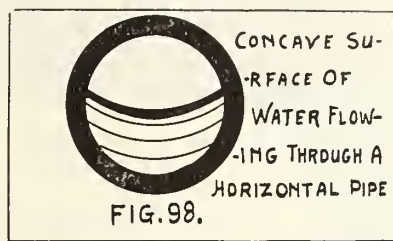
inches as the maximum depth of seal which a trap may have to remain self-cleansing.

Further experiments were made in order to determine how long a time it takes to lose the water seal in traps by evaporation. Four glass traps, of $1\frac{3}{4}$ and two-inches diameter, with two and four-inch seal respectively were used in the experiments. The average temperature of the air during the experiments was 20 degs. C (68 degs. Fah.). All ex-

other words, a trap with a four-inch seal would take under such conditions sixteen weeks to evaporate. About the same result was obtained by slowly pouring a wine glass of oil into the trap. Herr Unna concluded from these results that the usual length of summer vacation, during which houses may remain closed, will not endanger the seal of traps, but in houses which may be left vacant for a longer period of time, he advises removing the water from the traps and substituting glycerine for same.

In the experiments of siphonage, the vertical waste line consisted first of a two-inch pipe, and subsequently of a $2\frac{1}{2}$ -inch pipe. The diameter of the traps and branch connections was made successively $1\frac{1}{2}$, two and $2\frac{1}{2}$ inches. The $1\frac{3}{4}$ -inch traps experimented on had trap seals of 40, 60, 80 and 100 mm.; the two and $2\frac{1}{2}$ -inch traps had seals of 60, 80, 100 and 120 mm. At the highest point of its outer bend, each trap had an opening, into which was inserted a 10 mm. glass tube, 30 centimeter high (twelve inches) and bent in the shape of the letter S. (See Fig. 100.) A paper scale was attached to the glass tube, and the tube was filled with water to the zero point on the scale.

(Continued on page 18.)



periments agreed in showing that 10 mm. (2.5 inches) of water evaporated per week. A trap having a four-inch seal would accordingly be rendered useless by evaporation in ten weeks. The evaporation was much retarded when a flannel cloth dipped in oil was placed over the strainer in the fixture; it then amounted to only 6 mm. ($\frac{1}{4}$ -inch) per week. In

This illustration should prove very interesting to our readers, being a properly equipped experimental installation. Note the white outlined spaces on the pipe lines and fixtures, which denote glass sections, to enable the student to see what action really takes place.

—Editor.

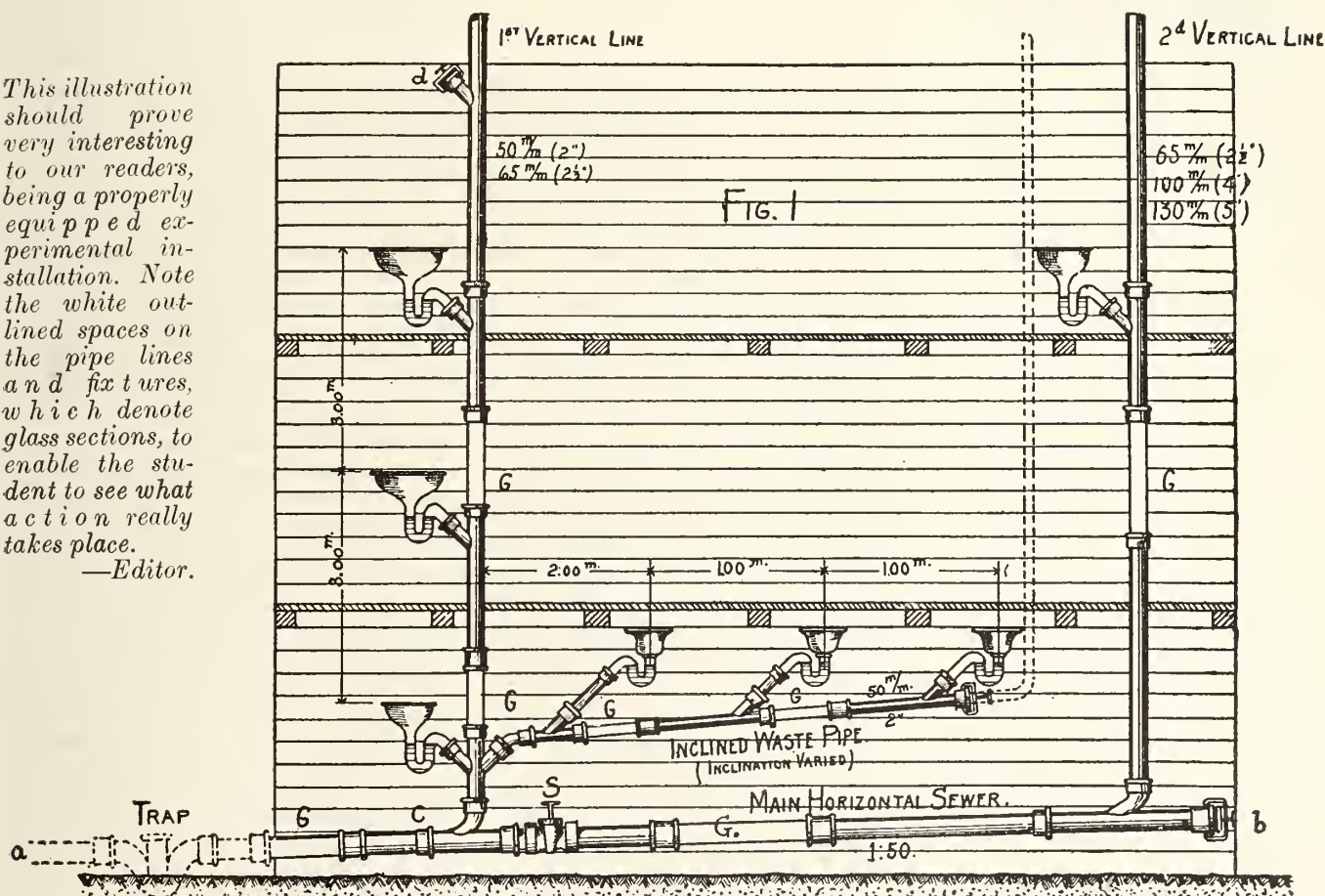


Fig. 96.—Pipe system used in experiments on trap siphonage.

"Velvet," Another Moses Irons' Story

Moses Irons Learns the Meaning of Creative Salesmanship.

*Reprinted from System, the Magazine of Business.

By Daniel Louis Hanson.

Illustrated by C. D. Mitchel.

JUST what do you mean by that expression of yours—creative salesmanship?" demanded Moses Irons. "You have used it pretty often in the last half hour."

Albert Pearson, the "Dixie Yankee," on the other side of the flat-topped desk, thoughtfully felt of his shoe-brushed coat.

"I don't believe I can answer that question, Moses, better than by telling you the story of James Dufva."

"That salesman of yours who went to New Orleans, changed his name from plain Duffy and sold German rocking bathtubs to the unsuspecting creoles? I've heard that yarn twice already."

"You've placed the man," Pearson assented, "but this is another phase of his activity, a later one—possibly a reincarnation. He left me after that New Orleans episode and went up into Wisconsin to sell tire-setters to country blacksmiths for a Rockford concern. But Dufva did not go very well among the Germanized citizens of the badger state. Or else, having once tasted the joys of real sales conquests, the game seemed too tame. At any rate, he came back to Memphis—and to me. To tell the truth, I was glad to see him, for he had qualities of initiative and executive that I felt would be cash for me if I could only keep him within bounds. Of course, I concealed my satisfaction at his re-appearance."

Moses Irons laughed. "Trust a Yankee never to forget caution in such matters," he threw in.

"Well, Dufva is the best example of a creative salesman I know. If you are interested—," Mr. Pearson glanced about the office as if in search of something. With a quizzical smile, Moses Irons opened a zine-lined drawer in his desk and brought out a box of cigars. "Try one of these, Albert," he suggested. "If it suits, the box goes to you by parcel post this evening. Light up and go on with the case of Dufva."

"Well," began Mr. Pearson, having carefully examined the lighted end of his Havana. "Dufva wanted a job and I wanted him, but I made a play about not having an open territory and all that. He cut me short. 'I want to work up a new field where I don't have to pay for the other fellow's mistakes, and where if I make good, the house will not think it is because of work that he has

done, bringing in belated results. Let me have the towns on the Southern Pacific out of New Orleans as far as I want to go in Texas.'

"Well, you know how good it sounds to have a job hunter lay out a plan of his own, and show he has another idea in his head besides that of merely getting on the payroll. So after a little discussion about salary and expense money, I gave Dufva a little of the latter and a lot of good advice and started him out."

"By way of New Orleans?" grinned Moses Irons.

"Yes, but he changed cars in the same depot, and with only fifteen minutes between trains. He wasn't taking any chances."

"He was wise," said Moses Irons. "Go on."

"Well, the first I heard from him was not through a souvenir postal card or a request for more expense money, but a real order from a 'G-I' customer. It wasn't a big order—some sales managers would have felt like looking upon it as rather a small affair. But the more I looked at the two sheets, the more I was attracted to them—for the items on them covered practically my entire range of stuff. And I knew that Dufva must have gained the customer's confidence to the extent of going over stock with him. That, Moses, means a great deal in these days of salesmen merely skimming off the top cream."

Moses Irons nodded appreciatively: "He was gettin the by-product, too."

"That is just it! When I started out of Boston thirty years ago, I got to be quite an acrobat swinging myself from fitting bin to bin with one hand, while in the other I held order-book and pencil. Well, this order of Dufva's—small as it was—brought back the old times and I sent him a jolly-up letter. He had the good sense to take it for what it meant and not come back with a demand for a salary increase. Now the temptation to most salesmen, covering a territory the first time in our line, is to concentrate on some specialty or other, which too often leaves in the customer's mind the impression that the house devotes itself to that one item and is pushing nothing else."

"That is a point well taken, Albert. In this case your customer bought two dozen or more different commodities from Dufva and will remember the Al-

bert Pearson Company of Memphis as general jobbers. It is a mighty good point." The ironmaster made a note of it on his pad.

Albert Pearson looked doubtfully at Moses Irons' rapidly moving pencil, but went on: "From that on, I heard regularly from Dufva. Nothing to wax enthusiastic about, but still something from a territory that was supposed to lie outside of our horizon. Of course, we did our part; those orders went out on the day they were received, and any shortage was sent at our expense. We were not assessing customers in the way of extra freight to pay for our mistakes in carrying a limited stock. There was also another feature of Dufva's work that appealed to me; he wasn't satisfied to pick up business from the prospects who were nearest the hotel, and let outsiders go unsolicited. He milked every town dry. I checked him up by the agency lists, and he had them all. Sometimes, of course, he did not sell each of the trade, but he made mention of all in his reports in a way which showed he had been inside of the door."

Moses Irons was giving his undivided attention to his guest: "You mentioned Dufva's reports. Was that a system you had already inaugurated and that he simply carried out?"

"We have always insisted on our salesmen making reports. We would have been fools to be without something of the kind. But they were used by the salesmen in a perfunctory manner—they had ceased to be vital. I had realized this and had done my level best to revitalize the system, but without success. You know that travelling salesmen, whose running about should make them progressive, are in many instances quite the other sort. I can't explain it, but so they are." "But for that very fact my life would have been a happy one," Moses Irons admitted in a dejected tone.

"But these reports of Dufva's were different—not merely that Jones was 'out,' and Smith 'stocked.' Now Jones might have been out, but Dufva reasoned that the closed door should not indicate that Jones was out of business or dead. Jones was still a possible asset; he very likely meant cash to the Albert Pearson Company. So he hunted around until he found him. Or if Jones was out of town, there was a letter awaiting that gentleman on his return. Each case pre-



sented a different phase and was handled as seemed best suited to it.

"As to the expression 'stocked,' I don't recall it in any of Dufva's reports. He might not sell Smith on that particular trip, but all the competition in the world or the necessity of making a train could not keep him from getting some information about Smith and putting it down in his report. Smith had this or that job, material would be needed on such a date. Or Smith was low on such an item; it would be advisable to reach him with a letter a week or a month hence. I tell you, Moses, each of those reports was a birds-eye view of one day's work. And in the name of business sense, what else should a salesman's report be?"

Moses Irons finished another notation before he replied: "But didn't all this clerical work take up too much of his time?"

"That is just what pleased me most. Dufva's reports were complete, but not voluminous. Six words after a customer's name, when submitted by him, meant more than a two-page letter from our other representatives. In fact, I believe he spent less time at the desk than did any of our men. He never fooled around with ink to make an excuse for not having sold this or that one. With him, a few words of constructive information took away the sting of missing an order, by giving us hopes for the future."

"And how did your office force utilize these reports?" asked Moses Irons.

"That's another story, Moses. This one is about Dufva. But this I'll say: he kept a carbon of them and was able to work hand-in-glove with us. In fact,

he did a good deal of the follow-up by himself, and still had leisure to be a good mixer.

"From San Antonio, on his first trip, he ran down for ten days in old Mexico—Saltillo, Monterey, San Luis Potosi and Chihuahua, coming back by way of El Paso. The trip didn't pay, and I so wrote him in order to discourage any repetition of it. His reply was the first eye-opener I had as to Dufva's dimensions. 'You will find eventually,' he wrote in reply, 'that this is the best sales investment you ever have made. I didn't know what selling was till I saw those low-voiced and courteously persistent Mexican merchants do business. I now realize how handicapped I have been by not even knowing the elementals of buying and selling as compared with the Latin-American past masters at the game.'"

"He wrote the truth there," exclaimed Moses Irons. "It's the same in Havana. While we have made nice money down there with our branch, we have cleared up vastly more by catching the spirit of Latin-American salesmanship, free, as it were, from that aggravating bumptiousness which so often characterizes our efforts."

"Yes, that is what he wrote," con-

tinued Mr. Pearson, "and that sort of a receptive spirit on his part set me to studying his orders carefully. First of all, of course, I looked for the velvet in them, and I always found it somewhere in each order.

"Never did I get a letter from him reading: 'You will notice that I sold this or that at a cut price; I did it to get a start with him. Dufva, on the contrary, always seemed to reason: 'That sort of thing does not pay. Even as an advertisement, it would teach only the man who is the beneficiary; and even with him it is valueless. I am out to sell goods at a profit.'"

"I would like to meet that Dufva," said Moses Irons, enthusiastically.

"It wouldn't do you any good, Moses," replied Mr. Pearson, meaningly. "Of course, Dufva had to sell the ordinary run of staples in that territory and there, as everywhere, the margin was pretty narrow. Somewhere in every order there would be tucked something that felt like velvet—was velvet, and enough of it to lift the whole order to a profitable basis. There was one item on which he was strong—tinned straps, such as are used by gasfitters. They were just opening the Eastern Texas gas and oil region around Beau-

mont, and the stuff was to be piped in every direction. Dufva put a tinued strap, three-quarter inch size, into his vest pocket. At the proper moment, when the customer, having ordered what he needed and on which there wasn't much profit, was planning a quick get-away, Dufva would pull out that strap and say: 'Look at this; see that rib around the middle—it would hold a ton.' The customer would take it and feel of the rib. 'That is a good one, sure; you may send me twenty gross.' As a matter of fact, the weight a strap of that size is called upon to carry is in pounds and not tons. But the customer forgot that fact, and we sold tinued straps in tremendous quantities when there was a big profit in them."

"I knew a man out of Boston, thirty years ago, who did the same thing on gas hooks, the grandparents of tinued straps," said Moses Irons.

"Dufva's idea is old, of course, but the art of salesmanship, like all other arts, consists in applying an old idea at the right moment. Well, after a month or two, I thought I had taken Dufva's full measure, and could safely thumb-print him on my identification cards. I knew all his mannerisms and flattered myself that I could read him as a book. In short, I felt that Dufva had no more surprises for me, and you know what that feeling means when you get it about an employee: you begin to lose interest in him.

"Then one day brought a request from an architect in San Antonio—his first communication to us, by the way—for a few circulars illustrating our 'Mentone' bathroom design. Of course they went out by return mail. But I got to thinking about that when home in the evening. As you know, I was handling a line of better class staples then, and was making some money. High-grade fixtures, such as solid porcelain ware, enameled allover iron, and others of a like quality, I had kept out of. I knew called for a certain amount of advertising, besides assembling rooms and brass shops, and why should I, with money in the bank, and with no one to carry on my name, embark on what might prove a disastrous adventure? Dufva had frequently urged me to do so, but I had turned a deaf ear to his arguments. The only concession had been the printing of some Mentone circulars to stop the encroachment of mail-order houses—painfully cheap literature it was, too. Yet Dufva had worked with the poor tools I had given him; had broken into the offices of one of the leading architects in the south and had interested that individual. I felt ashamed of myself, and in a flash I saw for the first time that the permanence of my

line depended on establishing a specialty line of fixtures that could have some talking points besides price. I needed goods which were so well known that no disgruntled salesman, leaving me, could not carry away my trade to another employer. I must capitalize something besides the personalities of my salesmen.

"Half the philosophy of business building is contained in that last clause of yours!" the ironmaster assented.

"By to-morrow morning you will say two-thirds," Pearson amended. "I took a short run through Dufva's towns, ostensibly on my route to California, and was amazed at the way they had grown—census figures are but sluggish things at best. The highest grade stuff was none too good for that section and it had the money with which to pay for it. I didn't go to California, but back to Memphis, where I called Dufva the next day. Then the two of us started on a month's trip through the north and east. We visited you here in Chicago, as you know. Then two weeks in the Ohio Valley enameling plants, and as long in Trenton where we saw the best stuff the big kilns were turning out. I wanted to leave an order while east for a big catalogue, but Dufva dissuaded me: 'Let's get it out, bit by bit, and keep them guessing,' he said. But I fancy now that he advocated that course to avoid mistakes."

"And you did."

"Yes, and saved some money beside. That was how the Albert Pearson Company of Memphis embarked in the specialty line, and why it is holding its own against competitors from cities five times the size."

"But Dufva sort of kicked you into the ring, didn't he?" and there was a reminiscent twinkle in the ironmaster's grey eyes. "It must be an unpleasant experience."

"Yes, but you get a wholesome respect for the employee husky enough to do it. Besides, it adds to one's bank account, and that heals the sores."

"So that is creative salesmanship, eh? And how do you recognize it; what test do you apply?" asked Moses Irons.

"My sales record is the barometer I use. Taking 1910 as the base for comparisons, Dufva's sales for 1911 showed twenty-five per cent. increase; for 1912 thirty-eight per cent. and in 1913, forty-two per cent. But our total business from his territory during the same years were, respectively, thirty-one per cent., forty-eight per cent. and sixty-six per cent. in the way of growth. He was creating business for his house and not merely for himself. And why? Because Dufva had, all the time, a fine sense of

proportion. He never looked upon himself as bigger than the house, or even as big. So he always fitted into team work, though he was also the best single puller I ever have known."

"I get you," said Moses Irons, after a reflective pause, "and here is another angle. Dufva was not one of those automatic salesmen, with whom you push a certain button and know just exactly what sort of an answering buzz you will get in the way of results. A fine scheme, that automatic affair—with only one drawback to it—you have to keep pushing the buttons as industriously as the pianist pounds the keys or else you get nothing. When you stop to take breath everything else stops with you. 'Do that,' you say to them and they do it, but not one rap more, since that would call for initiative and you alone have that. Oh! don't I know what that all means. But this Dufva was different. 'Creative salesmanship,' I guess that is right. By the way, Alhert, where is that chap now? I can give him a bigger future here than he can possibly hope for in a smaller town. And you don't want to stand in his way for bettering himself, of course."

Albert Pearson cocked an eye tantalizingly at his friend.

"Do you suppose, Moses, that I would have told you the story of Dufva, giving names and figures, without first having nailed him fast? I know your light-fingered tendencies too well to let a valuable man loose within your reach. Dufva is glued fast to the manager's chair in Memphis and there he will stick, while I see something of the outside world again."

SIMPLIFIED PLUMBING METHODS.

(Continued from page 15.)

Different sizes of strainers were used in the fixtures. The distance of the fixtures from the vertical pipe did not exceed 1 meter (3 ft. 3 in.) The influence which a reduction, an enlargement or the entire closing up of the upper opening of the pipe line had, was studied by means of reducer and increaser fittings and tight-fitting plugs.

The water was poured through each one of the fixtures on the three floors successively, and the action on the trap seals of the others was watched. Experiments were also made with the two upper or the two lower fixtures, and also with all three fixtures at one time. The volume of water discharged was one pail of water containing 15 liters or 3¾ gallons, and afterwards two, three or more pails.

Analysis of Can. Sanitary Engineering By-laws

Commenting Upon the By-law Known as By-law No. 528, Governing Sanitary Engineers and Sanitary Engineering Construction in the Town of Waterloo, Ontario.

(Continued from last issue.)

THE clause we will now discuss is somewhat original and one that is seldom found in by-laws.

Clause 15.—Every plan shall show the position, size, kind and weight of all pipes and the position of all closets and other fixtures.

This clause is very much to the point, and if enforced will prove a boon not only to the trade, but also to the public. If these plans were first submitted to the board of health, and approved before being submitted for tenders, it would ensure every sanitary engineer quoting on the same installation. It is very essential that every by-law should have such a clause embodied in it. It would make matters more clear, between inspector and sanitary engineer, as we have known scores of cases where men in all walks of life have been appointed to the position of plumbing inspector.

Clause 16.—All plumbing work shall be subject to the inspection, supervision and approval of the inspector and all faulty or defective work which may at any time be discovered, shall be made satisfactory to him.

This clause is very commendable, if the inspector appointed is a thoroughly qualified man. A man with not less than ten years' actual practice in the trade, with the ability to decide when any deviation from the letter of the by-law should be permitted. The writer heard of a case where a certain sanitary engineer proposed to adopt the use of a brass vent and waste tee instead of a crown vent. The centre of the trap and continuous waste was less than 12 inches, and the inspector did not allow the use of a continuous venting. In spite of the facts that the clauses in the by-law did not specify how the trap should be vented this particular inspector insisted upon the trap being vented at the crown. With such men holding positions as plumbing inspectors, the clause under discussion is dangerous. No man with the slightest knowledge of sanitary engineering construction would demand a crown vent in preference to a continuous vent.

Clause 17.—The inspector shall be notified when any work is ready for

inspection and the work must be left uncovered and convenient for examination until inspected and approved. Such inspection shall be made within five hours after such notification. The inspector shall apply the water test in the first instance and the smoke or peppermint test subsequently and the plumber shall furnish all necessary tools, labor and assistance for such tests. When work is found to be faulty necessitating a second or any subsequent test or inspection, then a further fee of fifty cents shall be paid by the plumber to the inspector for each additional test or inspection.

This clause is to some extent of a general nature. It is not, however, practical to all intents and purposes. For instance, there is no alternative test, to take the place of the water test in winter, and every practical man knows that it is an utter impossibility to water-test in the winter. Therefore we do not consider clause 17 complete. Otherwise it does not call for comment.

Clause 18.—After the plumbing work has passed inspection, a certi-

ficate of the same, when required, will be given to the plumber signed by the inspector, but such certificate will not relieve the plumber of the responsibility of the work as provided in section 16.

2 inches in diameter	5½ lbs. per lineal foot.
3 " " "	9½ " " " "
4 " " "	13 " " " "
6 " " "	20 " " " "

Above the highest fixture in the building, however, a four-inch soil pipe weighing nine pounds per lineal foot will be permitted.

This clause does not seem to be of any practical purpose. In other words, it says: "In spite of the fact that the inspector has finally passed certain work, and a certificate is duly granted by him, the certificate is of no value to either the public or sanitary engineer. It implies that if the official appointed by the council is not efficient enough to find out any defects this official is empowered to issue a certificate, even though the certificate is no good. In our opinion, if an official appointed to such a respon-

sible position is not capable of finding out defective workmanship, or of passing expert judgment upon quality of material used, he should not be appointed. The clause is unfair to the trade, and affords no protection to the public. We need practical men as inspectors who can detect faulty work, who are capable of saying whether work is good or bad, and who can stand by every certificate they issue or authorize.

Clause 19.—All material shall be of the best quality and all work must be executed in a thorough and workmanlike manner.

This clause too depends upon the ability of the inspector. No man who has not had a very wide experience, would be a fit person to judge either material or workmanship.

It is a good clause if properly and effectively enforced.

Clause 20.—All soil, waste, or vent pipes, within a building and within a distance of three feet therefrom, shall be of cast iron with securely leaded joints, or of lead with wiped joints. Trap-vent pipes may be of standard galvanized wrought iron with steam fittings.

Waste pipes may be of galvanized wrought iron with recessed fittings. If galvanized wrought iron is used for waste pipe the burrs must be properly reamed out.

This is a very desirable clause and its insertion is very creditable to the town of Waterloo. In spite of the fact that tile pipe has been condemned as being unfit to be installed inside the walls of our buildings, the city of Toronto, unlike Waterloo, still permits its use.

Clause 21.—The cast iron pipe shall be what is known to the trade as extra heavy and shall not weigh less than the following:

Clause 22.—All fittings shall correspond in weight and quality.

(Continued in next issue.)

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The system shown below is designed to meet the requirements of the average country home where the usual house fixtures are to be installed and where electric, water or engine power is not available. The complete system includes: Tank with supports, pressure gauge and water gauge, pump, two 1-inch gate valves, one 1-inch check valve, one $\frac{3}{4}$ -inch compression bibb and one $\frac{3}{4}$ -inch stop and waste. Our hydro-pneumatic pump is especially designed for the out-fit and will supply air and water simultaneously in the required proportion for a perfect pressure tank system or *water alone* or *air alone*.



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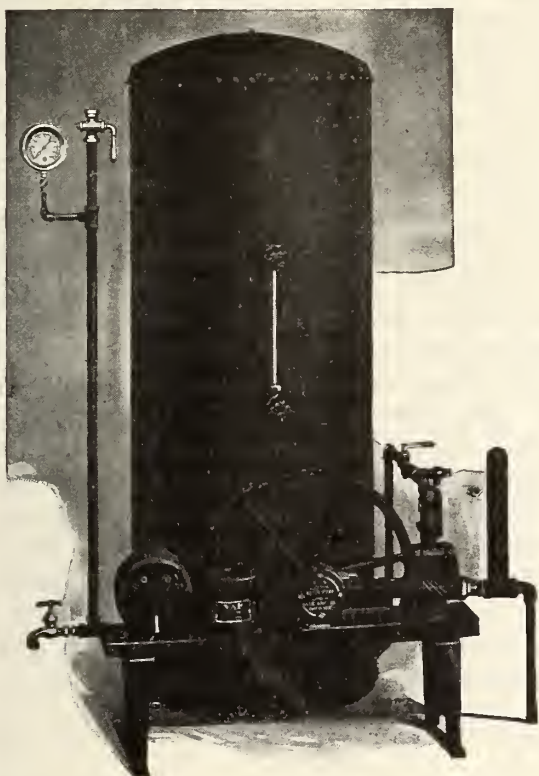
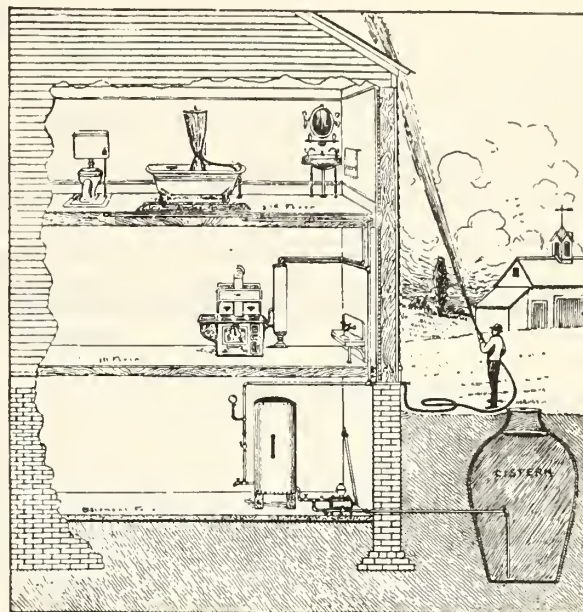
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TORONTO, DECEMBER 1, 1914

Create New Business

TO the sanitary and heating engineer who is a merchant, the problem of creating new business is not so difficult as to those who simply have a workshop and do not carry a stock of fixtures.

To both these classes we have a message which to the merchant is of greater importance. He should clean up shop and display each and every fixture in as seasonable a way as possible. A variety of bathroom accessories, soap dishes, glass holders, towel rails, etc., toilet paper fixtures, and an assortment of bathroom cabinets—any of these articles make very acceptable Xmas gifts. Of course we know that most hardware stores handle them, but why? The hardware store is not the natural place for one to buy such a line and it is simply because the sanitary and heating engineer has not given sufficient attention to this line. Vacuum cleaners are a sanitary appliance and would be a line which could be handled by sanitary engineers, not only the portable kind, but the stationary variety as well. Who should be able to install proper piping for stationary vacuum cleaners better than the sanitary and heating engineer? It is being proved to-day that there is a great deal more danger from dust than from sewer gas, and we all know that our customers would be filled with horror if they thought there was the slightest chance of sewer gas entering their homes. If toilet room fixtures are handled, they should be the very best quality, a quality that will give lasting service and not an article gotten up for Xmas trade or gifts. If there is one line which has been abused more than another it is that of toilet room fixtures. The public cannot and are not to be expected to judge the difference. Two towel rails may be gotten up to appear exactly the same, one can be bought for 50 cents and the other will cost \$1.50. One will scarcely last longer than Xmas week, the other for a lifetime. There should be a few samples of the poorer quality kept for the purpose of comparing the two. There will be more useful gifts bought

this Xmas than ever before, buyers will be looking for service in the goods they buy, and no article is more used than those of the bathroom line.

To the sanitary and heating engineer who does not keep a store, other methods of creating business must be resorted to. Then there is the question of fuel saving. This can be accomplished in many ways. How often are furnaces and piping in basements covered with asbestos or other non-conductors of heat? How many radiators are there fitted with humidifying pans? It is the duty of every sanitary and heating engineer to find out. Show your customers what you can save in the way of coal as well as giving more uniform heating. There is another problem in the heating business which is not given sufficient attention—that of temperature control. Thousands of tons of fuel are wasted, unlimited smoke is emitted into the air we breathe, tons of ashes have not only to be sifted, but also to be carted away, which would not be if the temperature of our buildings were properly controlled. It is an indisputable fact that 99 per cent. of our buildings are heated to at least 10 per cent. too high a temperature with little or no humidity, and no method of controlling the heat. These are all problems which would bring in work during slack times, if placed before the public in a proper light. If more attention were given to such problems, the sanitary and heating engineer would be looked upon more in the light of a benefactor than is the case to-day.

Ourselves and the War

HOW is the war going to affect the sanitary and heating engineer? This is a question which has been discussed by many of the craft. What is it going to do for us, or against us? How is it going to affect our business as a whole?

It is going to clear the trade of a big volume of undesirables. It is going to place the whole trade upon a higher plane if we are ready to respond in a proper manner. There are going to be fewer specu-

lative buildings erected, and higher grade materials will be demanded. In the future, when goods are to be bought, they will be bought with the view of service; service will be the keynote all along the line. There will be plenty of money to invest in service, the best and most capable workmen will be demanded, all with the view of higher class work. Poor workmanship means poor service, poor material is the same, and Canada has spent too much and not invested enough. The writer was looking over two heating jobs recently, material was fair in both cases except the valves. One of these installations had not less than 35 per cent. too much value in piping, 2 inch mains where 1½ inch would have been ample, the same with fittings. On one pair of mains there were no less than four, 2-inch nipples and eight angle elbows too many and so on, this was due to hiring men who did not devote sufficient study to the amount of radiation certain pipes would carry. In the case of the angle elbows, all that was required was a pipe bending jig, better circulation would have been gotten, which means saving in fuel and higher efficiency. The other job had no less than 750 square feet of hot water radiation on two pairs of mains and returns, so there was quite a contrast. Both installation were poor and both will cost too much to keep up. Each instance showed a waste of money and was a poor investment. The employer who allowed his men to use too much piping was guilty of a crime—the crime of waste in material as well as labor; the other employer was guilty of a waste of fuel, and labor. In fact such employers as well as workmen will soon find themselves scrapped. The time that is coming will not permit of this wanton waste. The war is going to be the cause of an uplifting movement. When employers hire labor, it will be the best they can get, and men will devote and are devoting more study than ever so as to become more efficient. The public will demand better service and will be willing to pay for it. All kinds of waste will be eliminated. Sewers will cease to be allowed to pollute our water supplies. Water will be conserved. Our cities will do less gambling in huge water works plants, by providing against too much waste. Our sewage disposal plants will give better service as a result. A thousand and one such movements will come about as a result of this war, every water service will be metered and this will cause a demand for better brass goods and higher class workmanship. No hot water system will be installed unless with a circulating pipe, and millions of gallons of water will be saved. The farmer will have more money to spend, every city dweller will envy the resident in a rural district, we shall have fewer big cities and more big villages and the sanitary and heating engineer will, if prepared, come into his own. No line or calling has such a bright outlook, but as we said before, he must be prepared.

Efficient Plumbing Inspectors

WE HAVE from time to time dealt with the problem of the appointment of efficient plumbing inspectors and not any poor jack of all trades and master of none. This question was again brought to our notice recently by several persons who dwell in small towns of 500 to 5,000 population. They claim that it would be out of the question to employ a practical man, because of the salary

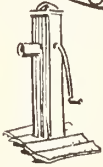
such a man would require. Such an argument may be alright so far as it goes, but there are several ways out of the difficulty. One method would be that the country should appoint several practical inspectors, and allot certain territory to each man. There are quite a large number of splendid men who could be of great value to our county councils. A practical man could plan septic tanks, advise the council as to how certain work should be done. He could plan work in the public schools, plan drainage systems throughout the county and give advice regarding water supplies. In fact a man with the necessary qualifications could earn his salary twice over as county plumbing inspector. The county could charge a certain portion of his salary to each town in the county, that could not provide its own plumbing inspector. Another way out of the difficulty would be to appoint a practical man with a number of duties, such as waterworks engineer, he could also be appointed to act as engineer of the fire department, and drain inspector. This man could advise the town council of all water wastes, and inspect buildings as to their sanitary condition. He would be the most valuable official to the town however small that town may be, and in the end, the public would not be called upon to provide all kinds of work of an unnecessary nature because of there being no one to advise. The small town is the happy hunting ground of the botch plumber, simply because there is no inspector there. There are also such botchers in business in cities, who, when they get a contract to install plumbing and heating in a county town where there are no by-laws in force, simply install any kind of goods and in any manner. The cry that small towns cannot afford to pay for the services of a practical man is a poor one, and there will be more work for such men from now on than there ever was previously. The farmer will be asking for city conveniences; there will be more sanitary engineering than ever installed when the provincial government demands that no lake, river or stream be polluted by the emptying of sewage into them. The heating problem, too, could be placed under the plumbing inspector and in that way the small town plumbing inspector could earn in actual service, every cent the town could afford to pay him.

Be Prepared

WE as a craft have accomplished more within the last 20 years than any other calling in the building trade but at what cost? We venture to say that as a whole there has been less profit accumulated per cent. than in any other trade. There are men in the sanitary and heating business to-day who if they had been engaged in another calling and had devoted as much time to it as has been devoted to their present calling would have been thousands of dollars in pocket. But why? We have not been prepared, we have not devoted sufficient time to study, we have been content to forge ahead over the thousand and one obstacles rather than to clear them away out of our path, and we are still doing the same. How many of the craft are there but what would have a nice balance to their credit at the bank if they had charged a fee for every tender they have submitted. All these questions prove the unpreparedness of the individual.

Rusticating with "The Sanitary Engineer"

Being some observations and comparisons made in the country by a Sanitary Engineer



HO!
HO!
HUM!

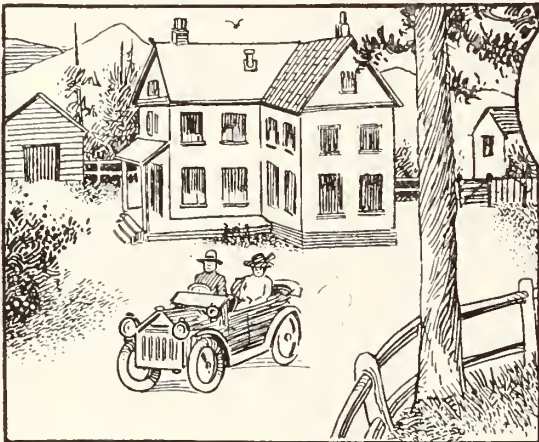


Insanitary farm premises have naturally a slovenly appearance

The Farmhands working under insanitary conditions are not capable of performing as good work as those in more up-to-date surroundings



Happy dreams which could be easily realized



Sanitary drinking troughs tend to make healthier and more profitable stock



The farm where sanitary accommodation is provided looks clean, trim, and prosperous

CASE 14

DINNER BELL

DING DING!

By dinner hour those working on an insanitary farm are feeling faded

After



Better work and more of it, with a happy contented feeling - the result of living on a farm where sanitation is appreciated

"We work on an insanitary farm"

Before he consulted a sanitary Engineer

Speculative building having received somewhat of a shock, Sanitary and Heating Engineers must look further afield for new business. The Farmer is the best present as well as future day prospect for the trade.

Heating and Ventilation Past, Present and Future

Taking Up the Question of Vapor Steam Heating, Showing the Essentials that Are Necessary in a Vapor Steam Heating System.

Written specially for The Sanitary Engineer by Harold T. Carter, of the C. A. Dunham Co., Ltd., Toronto.

ANOTHER method in steam heating, which is receiving quite a little attention, is that of vapor heating. Vapor heating has many very commendable features compared with many other systems of steam heating. Among the features in favor of vapor heating is the fact that no air vents or pet cocks are required on the radiators. No extra large piping is necessary as in a common one pipe system and practically no pressure of steam, except a few ounces (not a matter of lbs. of pressure) is required.

First, what is a vapor system? A vapor system is a two-pipe system of heating, utilizing a steam boiler, where you obtain heat sufficient to heat the building in which it is installed, and only requiring a few ounces of steam.

What is meant by vapor? Vapor is that heat energy given off by water before it reaches the boiling point 212° Fabr. You have watched a tea kettle upon the stove before water commenced to boil. You have felt it with the hand and found it to be quite hot. This is the heating medium used in the modern vapor system.

While the general layout and piping system for a vapor installation is the

same as a two-pipe gravity system of steam heating, the main difference exists at the radiator.

In the first place hot water radiators are used instead of steam radiators. These are tapped top and bottom connections, opposite ends, and the air vent openings plugged. Hot water radiators are recognized to be more efficient than steam radiators and they only are suitable for top and bottom connections. There are advantages in using a top and bottom connection.

The first is, since the heating medium is vapor and not steam at pressure, circulation is easier.

Secondly, with a top inlet and using a graduated valve the amount of heat required in the radiator may be regulated. That is, if you wish a low temperature radiator you turn the valve one-half or one-quarter on, and the smaller amount of vapor coming through the restricted opening and endeavoring to cover the same large surface in the radiator and in being diffused or spread out will give you a low temperature radiator.

Third, vapor steam being admitted at the top of the radiator becomes quickly condensed and the maximum amount of

heat units are given off by the water of condensation falling a greater distance down on its way to the return valve.

Fourth, having a top supply connection it is not necessary to stoop down to turn on the radiator.

From the foregoing description you can readily understand that you obtain positive regulation of each radiator and they may also be closed off without the possibility of freezing. There is no bursting of radiators, for when a radiator is turned off the vapor already in it condenses and flows into the return line leaving nothing to be frozen.

On vapor systems no pet cocks are used on the radiator as in most other forms of either hot water or steam systems of heating. This overcomes the nuisance incident to water or steam being allowed to carelessly leak out of the radiator, destroying floors and carpets in the former case and producing an objectionable odor in the latter.

Therefore, in a vapor system the conditions at the radiator are ideal. Each radiator is a small heating unit by itself, absolutely sealed, offering no opportunities for inquisitive persons to tinker or tamper with it. The supply valve is the only part of the radiator which can

PACKLESS
INLET VALVE

Typical layout of a modern vapor steam system of heating showing both method of connecting radiators, as well as piping and connections at boiler.

PACKLESS
INLET VALVE

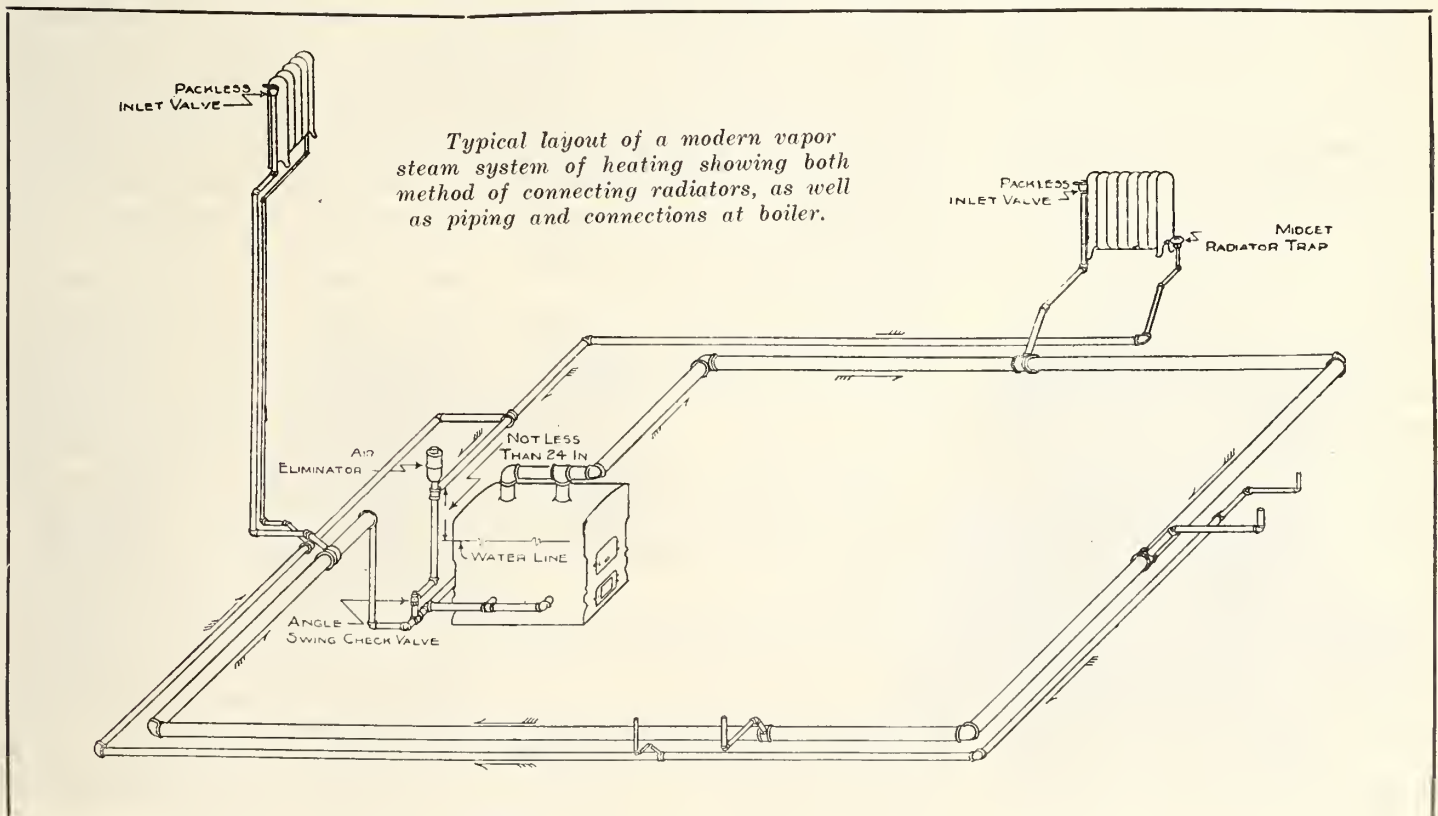
MIDGET
RADIATOR TRAP

AIR
ELIMINATOR

NOT LESS
THAN 24 IN

WATER LINE

ANGLE
SWING CHECK VALVE



be meddled with, and this valve is only turned off and on, governing the degree of temperature required in the radiator to heat the room.

On the return end of the radiator the types of valve used are all characteristic of whose vapor system may be installed and are made to prevent steam from leaking out of the radiator into the return line. This return valve or trap as it is called is the all important part of the system, or we might say the heart of the system. As stated, its function is to close and hold or trap the radiator full of steam while at the same time it will open and pass water and air. All the advantages and good qualities of the vapor system result from the ability of this trap to do its work properly. It allows for the greatest efficiency obtainable from a radiator by always keeping it absolutely drained of water and air thereby having every inch of radiating surface in contact with the heating medium. This trap also plays an important part in the circulation of the system for without the possibility of passing water and air from the radiators quickly it would not be possible to circulate on vapor.

A common objection met with in both two-pipe and single pipe steam systems is, the radiators are going to be too hot. This is quite true of a system circulating on one pound, two pounds or possibly four pounds pressure and will even be true of a vapor system when not possible to regulate the heat going into the radiator. Then, too, in the before mentioned steam systems the radiators are extremely hot for they have to be turned full on in order to maintain proper circulation. When a radiator becomes excessively hot its supply valve or valves as the case may be have to be turned completely off and the radiator allowed to cool down. Thus you have a system where the radiators are either roasting hot or no heat in them at all. In the single pipe system should the supply valve be partly closed, water will collect in the radiator, for the valve opening is then restricted and the steam entering the radiator through the same opening the water is going out at, water-hammer will result.

The same condition is true of the two-pipe system for although the steam is supposed to enter one end of the radiator, pass through and out the other end, yet this is not always the case. Steam may enter the radiator at both ends at the same time for the reason that there is steam in the return line as well as the supply pipe.

In a vapor system the outlet valve remains open as long as there is water and air to be passed out of the radiator whether the supply valve is wide open

or partially closed. The supply valve governs the amount of heat to be let into the radiator and has no connection whatever with the water or air leaving because of its elevated position on the radiator (see plan showing); thus allowing for a moderately heated radiator such as is possible in a hot water system.

On vapor systems as compared with one and two-pipe steam systems no air vents are used for the air is all discharged through the return line into the basement. This is partly accomplished by connecting the steam supply to the top of radiator. This does away with all air-vent troubles and since the opening through all vapor return valves is much larger than the pin hole opening common to air vents, the air is discharged from the radiator quicker; thus assisting in a freer and unrestricted circulation of vapor. The air discharging into the basement allows for more healthy conditions in the rooms and there is absolutely no possibility of leaks or foul offensive odors being emitted into the rooms.

Probably the outstanding and most general advantage vapor heating has over the ordinary steam system is that it circulates at such a low pressure. Circulating practically on vapor or even on a slight pressure, probably a few ounces, the boiler will need much less attention in order to maintain heat throughout the system. Besides reducing the attention required the greatest economy may be practised as far as fuel consumption is concerned.

In conclusion the prospective purchaser of a heating installation must first consider and realize the difference as pointed out between the three methods of heating namely hot water, single and two-pipe steam and he must see to it that if he decides on vapor as his method of heating, the system he selects is one that has none of their disadvantages and all of their advantages and if finally a vapor steam system of heating is decided upon the system he selects should be:—

Allow for any radiator on the system being no hotter when required, than a radiator on a hot water system.

Heat up quicker than a hot water system.

Circulate on vapor and retain its heat just as long as a hot water system.

Require no more attention than a hot water system and less attention than a steam system.

Should burn no more coal than a hot water system and not as much as a steam system.

Unless the vapor systems on the market to-day come up to these requirements we have yet to discover the successful vapor heating system.

Letters to the Editor

A Note on Land Values.

Editor, The Sanitary Engineer,
Toronto.

On reading, Reasons for Optimism, in the last issue of The Sanitary Engineer, it suggested the question, Why should it be necessary to remind anybody, that it is his duty to propagate the spirit of optimism. Depression is the effect of a cause, when it is general it is the result of some national maladjustment. If so, the right thing to do is to find out what that maladjustment is and then apply the remedy. National disease is analogous to individual disease; unless it is correctly diagnosed and radically treated it cannot be cured. We know that land value speculation has been raging in the West and elsewhere, like the yellow fever in the south before medical science sought for and discovered the cause, found the remedy and applied it. Now it is controlled. Every one knows that speculating in land values is nothing more nor less than gambling, and gambling is demoralizing. We prohibit all kinds of this vice, but the one referred to, which the law sanctions, and therefore encourages. True optimism is most desirable, but is it possible, for those who depend on their daily wages, to procure the necessities of life, to be optimistic, when they are deprived of opportunities for producing those necessities? Since there is no other way to produce wealth than by labor applied to land, (wealth thus earned is good), therefore we should encourage its production by freeing it from taxation at the same time encouraging the people to use land freely, by discouraging them from speculation in it, by increasing the tax on valuable vacant land to the extent it would be taxed if put to the best use. The evils that result from an unjust system of taxation, are innumerable. It only requires a little thought, to discover some of them. I am optimistic enough to believe that the abolition of the private ownership of land values, which are clearly the property of all the people, would result in such prosperity, as the world has not yet enjoyed.

W. R. Whitelaw.

Low Pressure and Exhaust Steam Heating

Showing How Exhaust Steam From an Engine May be Utilized to Heat Water Which in Turn is Used to Heat Buildings.

TO operate a steam plant at the greatest efficiency, every available unit of energy must, of course, be extracted from the steam. Taking steam that is raised to one hundred pounds pressure in a boiler, we find that its temperature is about 337 degs. F., and in the average non-condensing engine it is rarely that the steam is expanded until it is down to a temperature of 220 degs. F. Thus, all the heat used in raising the steam from a normal temperature of say 60 degs F. (which is a rather high normal temperature), is lost.

To the lay mind this loss is great, but upon investigation it is discovered that the loss is much greater than it appears to be upon casual observation. The amount of heat required to raise one pound of water one deg. F., is defined as one calorie, and it also requires one calorie to raise one pound of steam one deg. F. For all practical purposes this law applies to water at all temperatures and to steam up to all temperatures usually met with in boiler practice. However, at 212 degs. F., the temperature at which water becomes steam under atmospheric pressure at sea level, a peculiar phenomenon occurs.

One pound of water at 212 degs. F., absorbs 535 calories without the temperature being raised. The water turns from a liquid into the vapor, steam, and it appears that a pound of water must absorb 535 calories of heat in accomplishing the physical change. In such cases we always find action and reaction are equal and opposite. The result is that, when steam is condensed, this heat is

given off. Thus the waste of heat energy through the use of any atmospheric exhaust is much greater than would appear from a casual glance. There are two ways of utilizing a portion of this energy. The first is to use a condenser in connection with the engine and to feed the hot water of condensation back into the boiler again. The second way is to use the exhaust steam for the purpose of heating buildings.

Many successful systems of low pressure and exhaust steam heating have been devised, and thus many adaptations are in service to-day.

The New Manny Heater.

Among the number of very interesting heaters is that designed and manufactured by the E. S. Manny Co., Montreal. This heater employs an old idea in a new way. The exhaust steam is passed into the heater tubes and the water is heated. This water is the medium through which the heat is carried to the various portions of the building to be heated. The old principle applied is that of the surface condenser, but the manner in which it is employed is unique. The heater is placed upon a pedestal consisting of two cast iron pieces, the upper one of which contains the flanged elbow through which the water enters the heater. The upper flange of the elbow fits to a round machined boss on the cast iron body of the heater. The outlet is similar to the inlet and is placed on top of the heater body. One head of the heater is a simple casting as shown in the cut while the other head to outward appearances

is similar to the first, but upon closer examination it is found to differ largely.

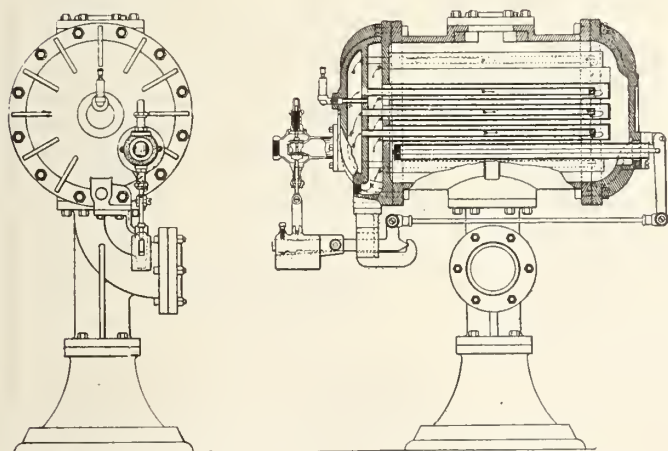
There are two separate cast iron plates in the head, and these serve as a crown sheet in the construction of the heater. The tubes are only fastened at one end, the idea being that, if the brass tubes were fixed at both ends, the expansion of the brass and iron being unequal, would soon cause the tubes to become leaky. The brass tubes are not expanded into the iron plates but are screwed in, and the pipes are not threaded by dies, but in a lathe so they all stand perpendicularly to the plate.

When in position, the heater is so placed that the tubes are horizontal. The tubes are all screwed in the outer plate of the heater head. In the inner plate of the head, there are screwed small $\frac{1}{2}$ inch brass tubes. These are located concentrically to the larger $1\frac{1}{2}$ tubes, and extend right through the latter to within a few inches of the end. The two chambers in the heater head are entirely separate from one another and are also both separate from the water chamber.

The steam is passed through the inlet and is forced through the $\frac{1}{2}$ inch brass pipes and because the larger brass tubes are plugged with cast iron pipe plugs, the steam after it passes out of the end of the small pipes returns through the annular passage in the large tubes and finally into the chamber formed between two crown plates, from whence it is drawn off through the outlet passage which connects to this chamber.

These heaters are made in five sizes; in all, however, the diameter of the

(Continued on page 29.)



END AND SECTIONAL VIEW OF MANNY HEATER.



THE MANNY STEAM TRAP.

New Sanitary and Heating Goods

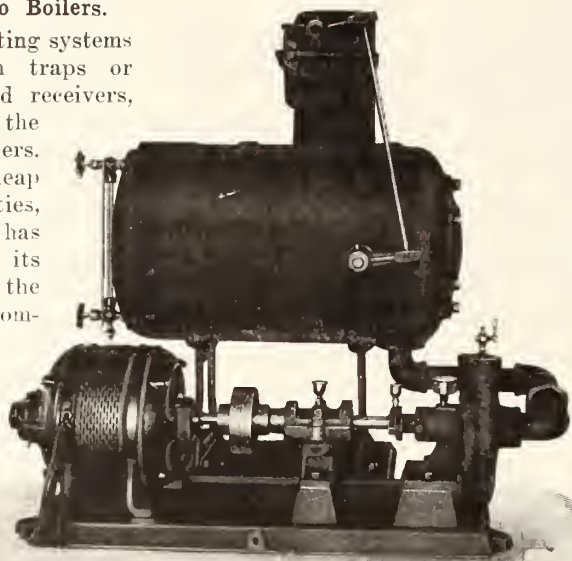
Returning Condensation to Boilers.

A few years ago many heating systems were installed using steam traps or automatic steam pumps and receivers, which were used to return the condensed steam to the boilers. Since the introduction of cheap electric power in so many cities, the steam-driven pump has proved less desirable, and its place is being taken by the motor-driven pump. The accompanying illustration shows an automatic feed pump and receiver, using centrifugal pump and electric motor, built by the Smart-Turner Machine Co., Limited, Hamilton, Canada, which has proved most desirable for plants using very low steam pressures. The equipment is built either for 25 or 60 cycles, or direct current, is self-contained on its own base, and the electrical apparatus is reduced to the very simplest form, so that there is practically nothing to get out of order.

Any further information desired may be obtained by application to the above company.

New Water Regulator.

There are thousands of hot water systems in Canada to-day, which have no means of opening and closing the



Motor-driven Centrifugal Pump and Receiver, W-155.

draft or damper doors, and if there is any accessory which is lacking in a hot water heating system it is such an apparatus. However, the Honeywell Heating Specialty Co. have, they claim, solved this problem, in putting before the trade their No. 3 water regulator, which will open or close draft or check automatically.

This extremely simple, inexpensive device will keep the water at any desired temperature between 120 and 240 degrees. It is connected directly into top of heater or to flow pipe, in such position that the circulating hot water will flow around the bulb of the regulator.

This causes it to open and close the dampers within a water temperature change of 2 or 3 degrees of the degree you desire maintained.

It has no rubber diaphragm or short-lived parts in its makeup. On the contrary, it is fitted with the well known Syphon Bellows.

Every detail in the manufacture of this regulator is of the highest standard. The regulator case and bearings are made especially heavy for the high temperature attainable. The lever and cable are strong enough to lift any damper five or six inches.

The height of the regulator is ten inches. Neck is threaded for one and one-half inch pipe opening. It measures five inches from the bottom of the bulb to top of threads and five inches from the latter point to top of regulator. The necessary cable and pulleys, a lever three feet in length and two ball weights are furnished with each regulator.

Any predetermined water temperature may be maintained by setting these weights in or out on the lever.

The frictionless, knife edge, bronze bearings with which this regulator is fitted, make it very sensitive to the slightest change in the temperature.

As the temperature of the water rises, it acts on a quantity of volatile fluid which is hermetically sealed in the bulb of the regulator. This fluid then vaporizes and forces the plunger up in the centre. As this plunger rises it centres in a conical opening of the rocker and lifts the rocker, which is fastened to the lever.

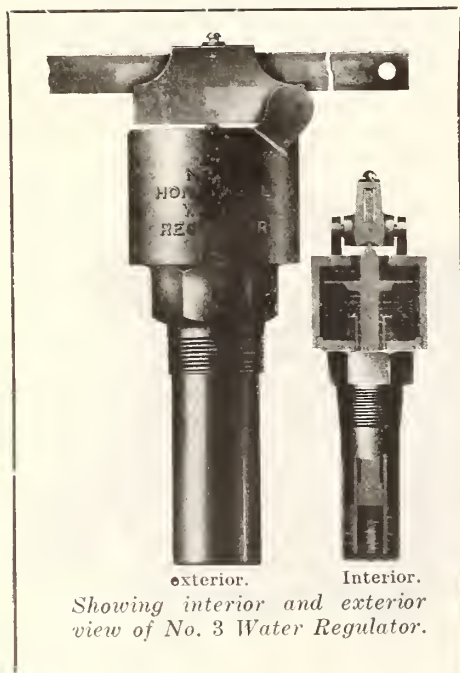
Then, as the temperature drops, the vapor condenses, and the plunger and lever are lowered.

Thus the dampers are opened and closed just as the water's temperature rises or falls a degree or two from that wanted.

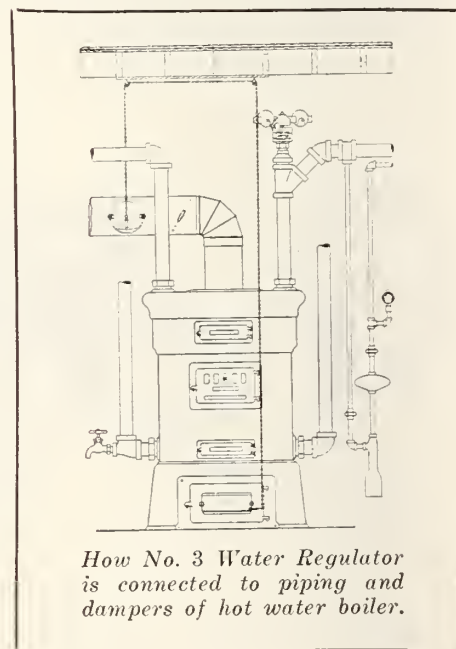
There are many uses to which the No. 3 water regulator may be put.

When used for controlling the temperature of water in storage tanks, where water is heated by a tank heater, the regulator may be connected into one of the tappings on the top of the heater if convenient, and the weights so placed on the lever that any water temperature may be maintained in the tank as long as there is fire in the heater.

For regulating the temperature of the water in hot water heating plants in greenhouses, there is no other device so dependable and well suited as the No. 3 Honeywell. In addition to maintaining



Showing interior and exterior view of No. 3 Water Regulator.



How No. 3 Water Regulator is connected to piping and dampers of hot water boiler.

a given water temperature, the lever may be connected to an electric light switch, or bell circuit, to warn the florist on cold nights of falling temperature, should the fire burn low before morning.

There is nothing about the No. 3 Honeywell Water Regulator to ever get out of order and we unconditionally guarantee it.

New Booklet and Handy Card.

A very interesting little booklet on wrenches is being issued by Kroeschell Bros. Co., 452 West Erie street, Chicago, Ill. They are also distributing a very useful card for pipe fitters and heating



Chain wrench that can be used on square or round beaded fittings.

engineers, showing table of 45° offsets figured from 1 inch to 12-inch with centre to face of 45° fittings. Pipe card showing sizes of openings for pipe tapping, heating surface, working pressure, area, weight. Every heating engineer can procure the above by writing to address given.

LOW PRESSURE AND EXHAUST STEAM HEATING.

(Continued from page 27.)

tubes is just the same, the increased heating surface being obtained by using more tubes and increasing their length.

The Manny Steam Trap.

In conjunction with these heaters, a steam trap is often installed; however, these steam traps are also employed in various other cases as well. In long pipe lines, condensation is inevitable, and thus if reasonably dry steam is desired at the end of the line, a device to separate the water from the steam is necessary. In the case of the heaters, it is not economical to use other than exhaust or low pressure steam. The case of the traps is, however, different, because they must be designed to operate under all pressures of steam.



END ELEVATION, MANNY HEATER.

In the Manny steam trap, the mechanism is similar in the low pressure and high pressure designs. The size of the water discharge port is however changed. By referring to the cut an idea of the trap can be obtained. The water chamber is a well proportioned and neat looking casting. The inlet opening is threaded ready to receive the steam pipe. A small air cock is located on the top of the casting and a similar drip cock at the bottom. The gauge glass is fastened to one side. To the hand hole cover at one side of the chamber is attached the whole mechanism. Four cap screws hold this cover in place and by removing these four screws, the cover and mechanism can be quickly removed from the casing

without in any way disturbing the pipe connections.

Operating Mechanism.

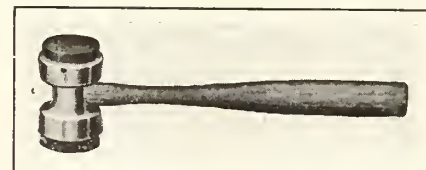
The mechanism is actuated by a seamless copper float ball attached to a brass rod. This rod is attached to a brass bell crank which opens and closes the water drain valve. All the working parts are brass, copper or bronze. The valve opens into a port in the hand-hole cover, which conveys the water around to the port in the body of the casting. This latter port leads to the discharge opening. The outlet is a double one, allowing the water to be piped from either side to the feed water heater or hot well. The outlet, not in use, has, of course, to be plugged.

The two outstanding features of this trap are its simplicity and accessibility. The whole mechanism can be removed from the trap and taken to a place conveniently situated where good light is obtainable to make any repairs or adjustments. Inside the float chamber a rib is cast which fills a dual purpose. The first purpose is to prevent the float from opening too wide the water discharge valve, and the second is to add strength to the sides of the cast iron chamber. When under high steam pressure, this reinforcing rib prevents the sides from spreading.

It is often advisable to quickly get rid of the water of condensation in a cold line of pipes and, to accelerate this, a by-pass is fitted to the trap. By this means the water is quickly gotten rid of. The trap works with steam at atmospheric pressure, but the greater the pressure of steam, the higher up the water of condensation can be forced to a feed heater. The traps are also built in five sizes.

The Chatham Mallet.

The new "Chatham" mallet being made by the Gong Bell Manufacturing Company of East Hampton, Connecticut, is being offered to the Canadian hardware trade. The "Chatham" is a two-



The Chatham Mallet.

faced mallet, made of malleable iron and finished in aluminum. The heads of vulcanized fiber are said to be practically indestructible. The handles are made of seasoned hickory of graceful lines. This mallet is manufactured with the idea of hard usage either against metal or wood,

(Continued on page 34.)

The Principle of Elbow Pattern Developing

A Complete Course, Treating in a Simple Way, the Art of Elbow Pattern Developing. Specially Written for Those Who Have Only Received a Limited Geometrical Education.

By EDWIN NEWSOME

IF there is one portion in the study of pattern development that is of greater interest to the apprentice than another, it is that of thoroughly mastering the principles involved in the developing of various elbow patterns. There is more to be learned than one can teach. The teacher can only go part of the way, and before any person has really derived the satisfaction of "knowing how" he must have worked the various problems out in his own mind and cut many a sheet of metal to waste into the bargain. The writer never yet made an elbow, be it whatever kind, without feeling that such an accomplishment gave a certain degree of satisfaction.

There is a certain fascination in elbow pattern developing and to one who has thoroughly mastered the principles there is nothing which would raise one's ire sooner than to see or have to fit up a poor lot of elbows.

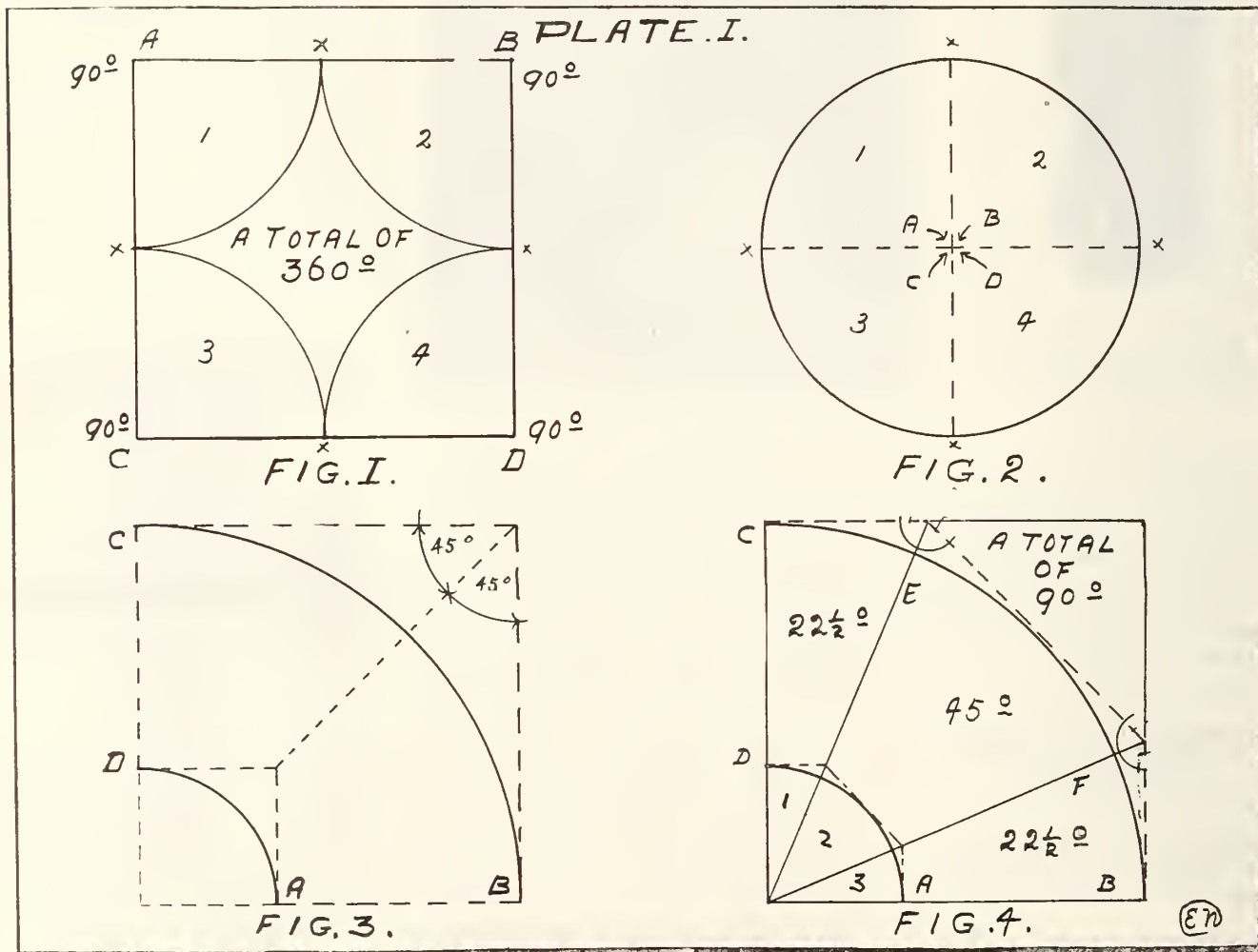
There is no part in the work of the tinsmith's or sheet-metal worker's practice which is so necessary as elbow practice, no matter what curve, offset or turn is required either round, square, or oval, it can be overcome by elbow pattern development.

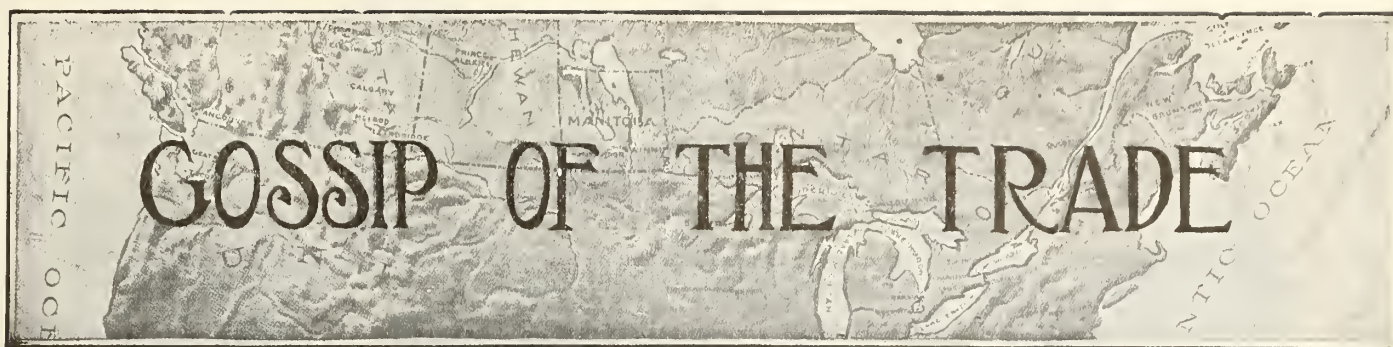
For this reason it is necessary to study the various angles, mitres and degrees. No matter how many pieces an elbow has, each piece should be some specific degree so that by adding the number of pieces they will eventually make 90 degrees.

For example we will draw a perfect square, Fig. 1, every square has four corners of 90 degrees, and to get perfectly around these corners we must make a turn of 90 degrees, some way or other, and if it requires 90 degrees to turn each corner of a square, four such turns must make a circle (see Fig. 2). When we speak of developing a two-piece 90-degree elbow, we mean that an elbow is to be developed with two parts of 45 degrees each from a given line, so that by joining the two mitres of 45 degrees a point will be reached which will be 90 degrees from that given line (see Fig. 3, lines A, B, and C, D.). Therefore in Fig. 3 we see that at points A, B, C, D, including the dotted mitre line, we have the elevation of a two-piece elbow, proving also that it would require eight pieces of 45 degrees to make a complete circle of 360 degrees. Fig. 4 gives us the elevation of what is termed a 3-piece elbow.

Now, in a two-piece elbow, both pieces are the same mitre, from lines A, B, and C, D, in Fig. 3; but in a 3-piece elbow such is not the case, although the mitres are the same degree, pieces number one and three are $22\frac{1}{2}$ degrees each, there is only one mitre to each piece, whereas piece No. 2 has two mitres of $22\frac{1}{2}$ degrees each, the three again making a total of 90 degrees.

(Continued in next Issue.)





Gas Supply Pure in Ontario Cities.

Ottawa, Nov. 16.—Gas inspection in the different cities of Canada show some widely divergent results as to illuminating power. In Toronto 104 tests were made, and all were up to standard, and in Montreal 105 tests with a similar result. Other cities where the illuminant is up to the mark are London, St. John, Halifax, Hamilton, Belleville and St. Thomas. The showing is not so favorable in Ottawa, where out of 82 tests 26 were below standard, while in Winnipeg 75 out of 102 were bad. The worst showing proportionately was in Vancouver, where out of 23 tests 21 were below standard.

Back to Guelph.

The Fergus Plumbing and Electrical works closed here last Saturday, and removed their stock to Guelph this week. Mr. Jeans expects to remain in town, however.—Fergus.

Appointment of a Plumbing Inspector Recommended.

At a meeting recently of the civic Board of Health, St. Kitts, Dr. Elliott, Mayor Petrie and J. K. Kernahan were present, Dr. King, medical officer of health, reported, recommending the appointment of a plumbing inspector.

Mimico to Build Water Works Plant.

Preliminary steps to make a start on the proposed water works and sewage disposal plant here have been taken by the village council. The engineer, Mr. T. Aird Murray, has received instructions authorizing him to prepare plans and specifications for the construction of an up-to-date filtration plant, water works, sanitary system, and disposal plant.

The exact location of the proposed plant has not been definitely determined, but will probably be in the eastern section of the village near the Mimico Creek.

The water works will probably be situated at the foot of Church Street. At

the outset sewers will only be laid on the Lake Shore Road and Church street. The initial cost is estimated at about \$125,000.

The plans now being drafted will first be submitted to the Provincial Board of Health for approval before being accepted by the village council.

Useful Invention.

Mr. J. Napier, an auto expert of Ottawa, has invented and patented an entirely new and highly effective safety

THE BULL-DOG STRAIN.

The bull-dog is typical of the British race—men fearless in attack, grim and determined, tenacious, invincible. We in Canada are proud of the bull-dog strain in us—that quality of blood and heart that makes us dauntless and masterful. The bull-dog strain shows in us and others in times of peril and menace.

Everywhere in Canada manufacturers, wholesalers and retailers of the bull-dog breed are answering the challenges of war—the challenges of trade disturbance and business opportunity. The identity of some of these valiant-hearted merchants and manufacturers is revealed in the advertising columns of this and other newspapers, for advertisements are expressions of courage, tenacity, and mastery.

Bull-dog blood shows itself and its quality in fighting.

device and economizer for use in connection with the gasoline-blow-lamp., as used by auto-mechanics, plumbers and other tradesmen.

The device, it is claimed, increases the efficiency almost 100 per cent., and eliminates much of the danger of fire from the intensely hot flame these torches give off, while it is capable of being attached to any ordinary torch and takes up little room.

Provincial Official to Go to the Front.

Mr. F. A. Dallyn, Provincial Sanitary

Engineer, has received his commission as captain in the Hydrological and Sanitary Corps, and will go to the front with the second contingent.

Water for Port Dalhousie.

St. Catharines.—The City Water Commission has recognized the moral claim of the village of Port Dalhousie on the city for connection with the city water system, on the grounds that St. Catharines empties sewerage into the old canal, a natural waterway passing the village. A plan is proposed to supply Port Dalhousie from the city system, the village to lay a main to the city limits, maintain it and pay a rate to be agreed upon later.

Plumbing Ripped From New House.

Four men were arrested in Toronto recently while attempting to dispose of a quantity of lead pipe to a second-hand dealer on Niagara street.

For several weeks property owners have suffered severely in the middle and western sections of the city through the operations of an apparently organized gang of lead pipe thieves. In spite of police supervision many vacant houses have been entered and expensive plumbing fixtures ruined. The damage so far reported to the police is estimated at several hundred dollars.

The lead pipe which the men were caught selling yesterday had been torn only a few hours previously from 93-95 Walnut avenue. In this case the plumbing of the houses had been entirely renovated, the work being completed yesterday morning. Within an hour after the workmen had left the house, the plumbing was ripped from its place. The men were attempting to sell the pipe for \$1. It was worth about \$60. The police expect to make further arrests.

This is only one of the many instances which have taken place and we feel that if persons will take the trouble to tear out work, they will not stop at stealing material which is left around in unfinished buildings. Sanitary and heating engineers leave too much material laying around in unfinished buildings which no doubt is a temptation, and without doubt results in a big loss.

Practical Course for Sheet Metal Workers

Article No. 6 of Series

By CHARLES SEIVERS

Fig. 1.

TO bisect a given angle let A-B-C be the given angle. With B as a centre, and with any convenient radius, draw an arc cutting A-B at E and B-C at D. With D and E as centres and any convenient radius, draw two arcs to cut each other, as at F. Draw a line joining B to point at F. This line will bisect the angle A-B-C.

Fig. 2.

To trisect a right angle, let A-B-C be the right angle. With B as a centre, draw an arc to cut B-A and B-C at D and E. With D and E as centres, and B-E as a radius, draw arcs to cut arc D-E at F and G; then draw lines from B to F and B to G. These lines will trisect the right angle.

Fig. 3.

On a given line to construct an equilateral triangle. In Fig. 3 let A-B be the given line. With A and B as centres and A-B as a radius, draw arcs cutting each other at C. Draw lines from A to C and B to C. The triangle formed by A-B-C is an equilateral triangle.

Fig. 4.

To construct an equilateral triangle of a given altitude. In Fig. 4 let the line I be the given altitude. Draw a line as A-B. From any convenient point draw on A-B; then draw a line at right angles to it, as C-D, and make C-D the length of the required altitude, as at I. Through D draw a line parallel to A-B, as shown at E-F. With C as a centre, draw a semi-circle, cutting A-B at K and L. With K and L as centres, and C-K as a radius, draw arcs to cut the semi-circle at G and H. Through G and H draw lines from C, to cut the line E-F. The triangle formed by these lines is an equilateral of the required altitude.

Fig. 5

To construct a triangle, the length of its three sides being given. In Fig. 5 let the lines 1-2 and 3 be the length of the three sides. Draw a line as A-B making it equal in length to the line at 1. With A as a centre, and a radius equal to the line 2, draw an arc, with B as a centre and the length of the line 3 as a radius, then draw an-

other arc to cut the first one at C and draw a line joining A-C and B-C. Then the triangle A-B-C is the triangle required.

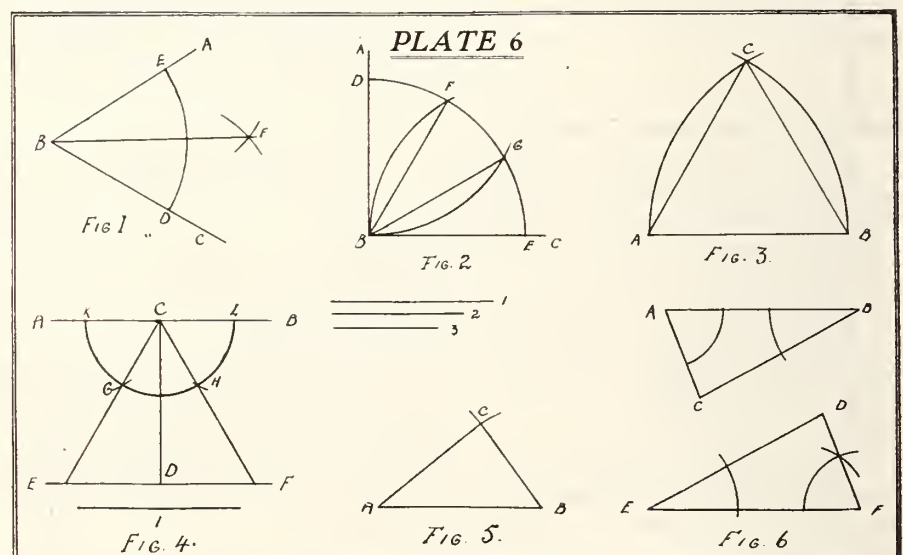
Fig. 6.

On a given line to construct a triangle with angles equal to a given triangle. In Fig. 6 let A-B-C be the given triangle. And E-F the given line. At E make the angle D-E-F equal to the angle at A-B-C. And at F make the angle E-F-D equal to the angle at B-A-C, and as already described in Fig. 4 in the fifth of this series, extend the lines forming these angles until they meet at D. Then the triangle D-E-F will have its angles equal to A-B-C.

RAZOR SCARCITY.

Sheffield, England, is suffering from a dearth of razors of the cheaper military grades. To meet army requirements and to make good the wastage in the field the authorities have bought up all existing stocks of suitable razors in Sheffield. T. B. Lee, a wholesale dealer in cutlery and hardware at Toronto, informed Hardware and Metal that he had this week received a cable from one of the English firms he represents, asking if he could supply a large number of razors. In the recent issue of the English Ironmonger, the following information regarding the razor situation appears:—

"The War Office is about to place a contract in Sheffield for 500,000 razors and this will be the largest order of the kind on record. The razor-makers, who are seriously behindhand with deliveries, are criticizing the specification, because the regulation pattern is adhered to and the blades must be hand-forged. The latter provision will hinder the execution of the work, because Sheffield contains comparatively few razor-forgers, and authorities state that the order cannot be completed within two years. It is felt that in the prevailing abnormal circumstances contractors should be allowed to produce the razors by any available means, so long as the quality is satisfactory. The forging machinery in the city is also proving quite inadequate for present requirements. A difficulty has now arisen with regard to the supply of horn razor-seals. Merchants have bought up all the ox-horn to be obtained in the country, and, when it is exhausted, the position will be serious. Vulcanite and other compositions are too brittle for soldiers' use, and the War Office insist upon horn. With every razor a tablespoon, knife and fork, and pocket-knife are served out to each soldier. The necessary number of spoons can be produced without difficulty since, being unplated, their manufacture involves comparatively little work."



In developing the above problem we suggest that the student make his drawings four times the size of the above sketch.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

No Hot Water From Kitchen Boiler.

Editor Sanitary Engineer:

Enclosed please find a sketch of a domestic hot water system which recently came under my notice. The owner could not get hot water at the sink and bathroom when the fire was out, no matter how hot the water in the kitchen boiler was. In fact, the hot water forced itself down into the city supply in the basement. It is, however, possible to get lots of hot water where the stop cock A in the supply to the 40-gallon boiler in the basement is shut off.

I presume they have been drawing water from the basement boiler all the time, it offering the least resistance to the flow. A suggestion through your valuable columns showing how to remedy the trouble, without removing the basement boiler will be much appreciated.

J. McN.

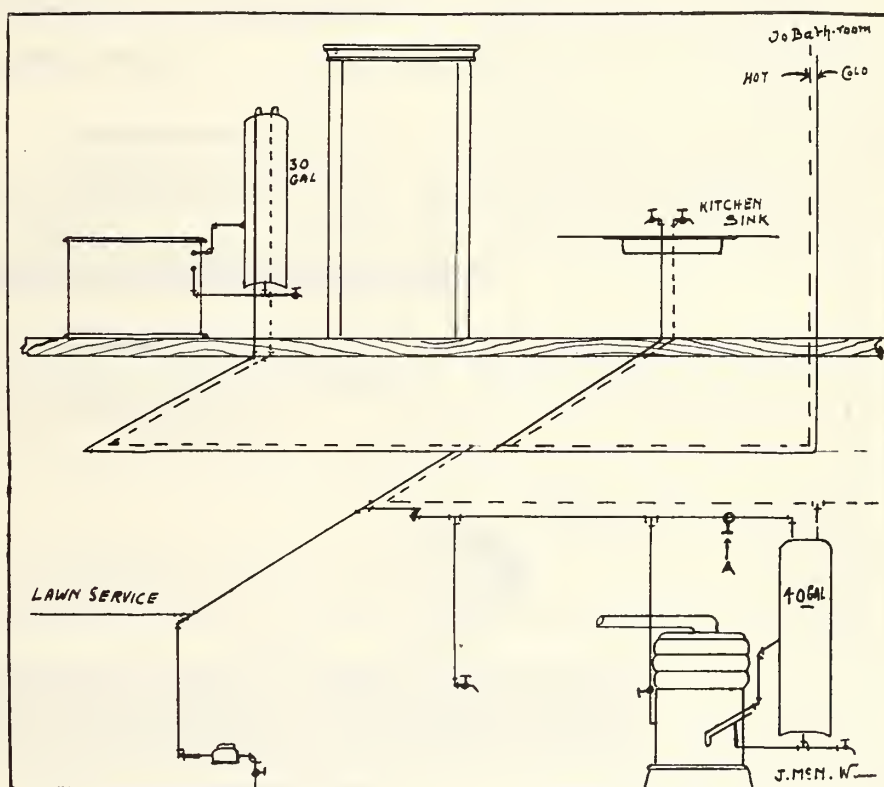
No doubt our correspondent is correct when he states that water has been drawn from the basement boiler. If our readers will look at the sketch submitted they will also see how easily the hot water can be drawn from the kitchen boiler at the cold water tap in the basement, simply because there is sufficient pressure to start the flow and the height of the source would also assist it. It is one of the most difficult problems in the world to make two boilers supply hot water alternately, unless valves are placed on both the cold supply pipes as well as the hot, because if valves are not on both pipes the water is apt to mix. The writer has, however, seen similar installations made to work fairly well when a circulation pipe has been installed as shown in the sketch submitted. This can very easily be done by taking out the hot supply pipe from the basement boiler and connecting to the verti-

cal hot water pipe to the bathroom and kitchen. Then break the hot water supply from the boiler in kitchen which drops to the basement and connect it to the lower pipe on the range connection. Then carry an overhead pipe from the

Why Cover a Furnace With Asbestos?

Editor The Sanitary Engineer:

I have read many advertisements and other matter on saving fuel by covering pipes and furnaces, but except in figures, I don't remember ever reading why or



Plan of layout submitted by constant reader.

kitchen boiler and connect up as shown. If it is found that hot water still flows from the cold water basement taps we would advise that the plan Fig. 3 be followed, this can be done by simply disconnecting the supply at the tee in the basement and run another overhead cold water supply pipe as shown.

—Editor.

how fuel is lost by not covering the pipes and furnace. Would you please inform me what I'm losing?

A Fitter.

Replying to "A Fitter," we will endeavor to show what he is losing. In the first place, most furnaces are installed in a cold basement; at least the coldest place in the house. Now, suppose it

takes ten tons of coal to heat a house during a period of ten weeks, and in that house there is 1,000 square feet of radiation, your furnace, we'll say, is 6 feet high and 10 feet in circumference, that is equal approximately to 60 square feet of radiation at least. In such a case you are losing at least this same amount of radiation heat. The writer has frequently saved as much as 10 per cent. in the coal bill. Not only that, but you have a cool clean cellar, which is far better than a warm one.

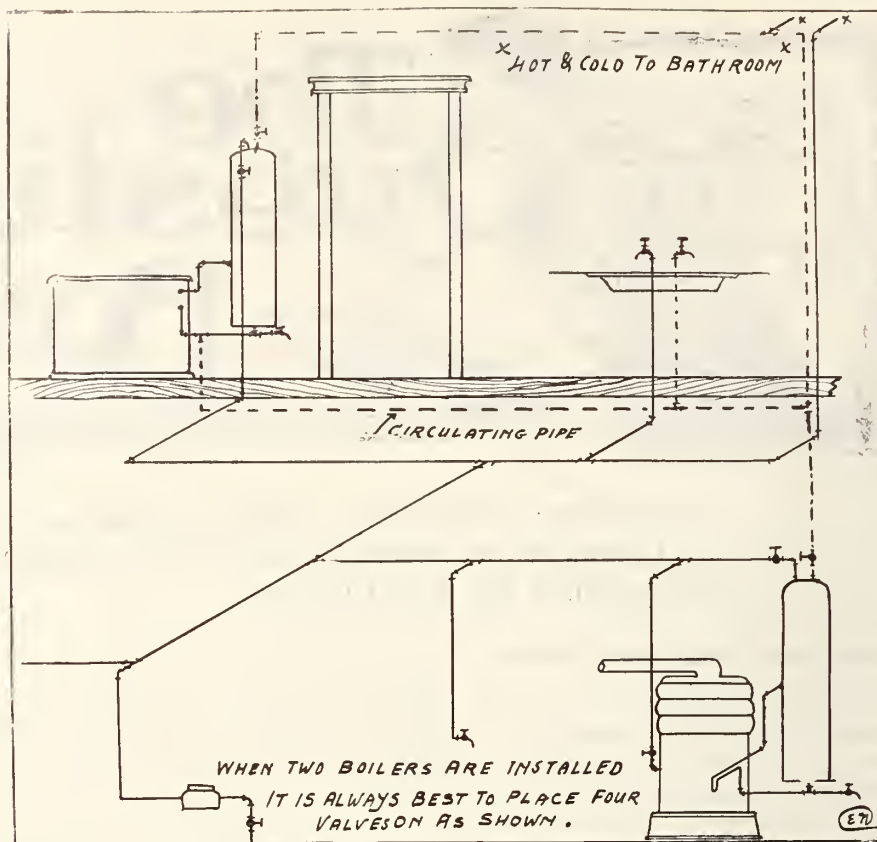
If sanitary and heating engineers would sit up and take notice, do a little missionary work, show the public the way to increase the efficiency of their heating plant, they would not only perform a service for the public, but would also make money. Now is the season to hunt up such work.—Editor.

How to Save a Foot of Depth.

Editor Sanitary Engineer.—I was very much interested in the septic tank which you published details of some time ago, and have come across a job where I am going to have the tile pipes about a foot too deep if I build my tank in the usual way. How can I overcome the trouble and still have the tile pipes a foot or so underground. An early reply will oblige.

A. C. R.

Replying to A. C. R. we herewith show in Fig. A, both plan and elevation of a tank which will overcome the trouble. Care must be taken that each tank be the same cubic area. This tank is fitted as will be seen by a quinn valve.—Editor.



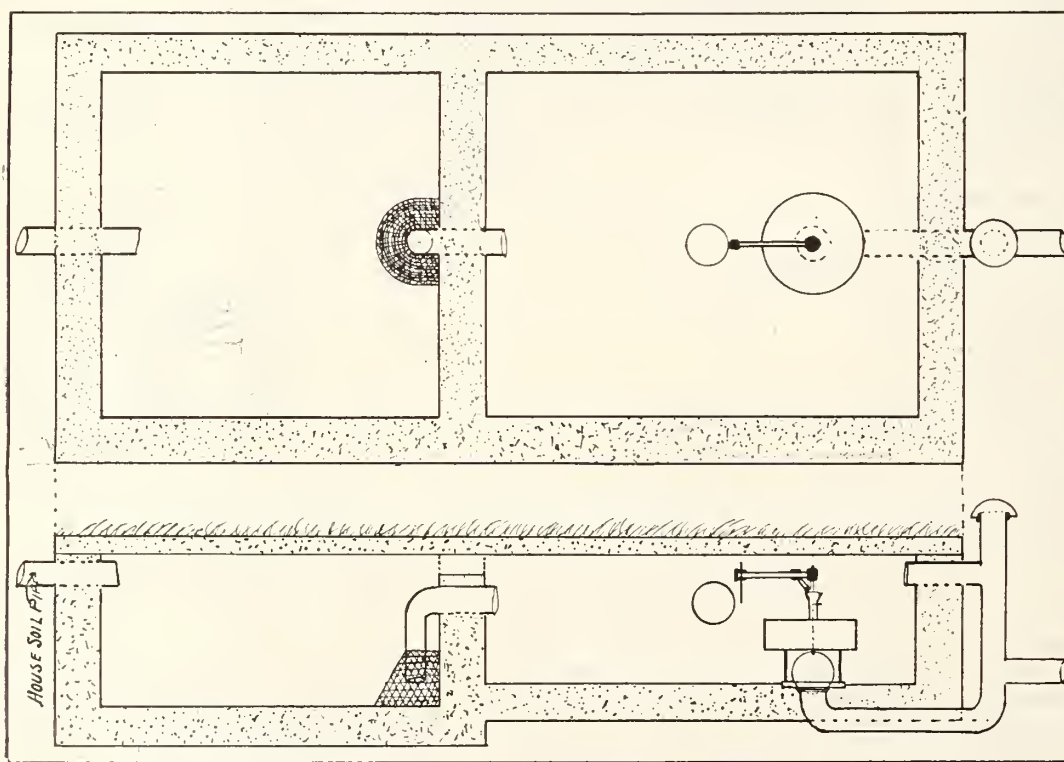
Suggested plan to improve the matter.

The Chatham Mallet.

(Continued from page 29.)

the fiber heads tending to prevent denting of material. For the automobilist, or repair and garage men, carpenters, pattern and cabinet makers, plumbers,

etc., the manufacturers claim no better mallet is made. The size of the head is two inches in diameter and $3\frac{5}{8}$ in. in length. The vulcanized fiber heads are removable and can be renewed should the occasion demand.



Showing how a septic tank may be built when every inch of height is of consideration. Care must be taken, however, that the same cubic contents are provided in each tank by making one longer than the other as shown in plan and elevation. In constructing a cement septic tank a small quantity of hydraulic cement should be mixed with the ordinary concrete and packed down near the inner side of the tank. One of the main points is to be sure they are water-tight. (E.T.)



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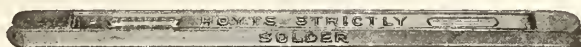
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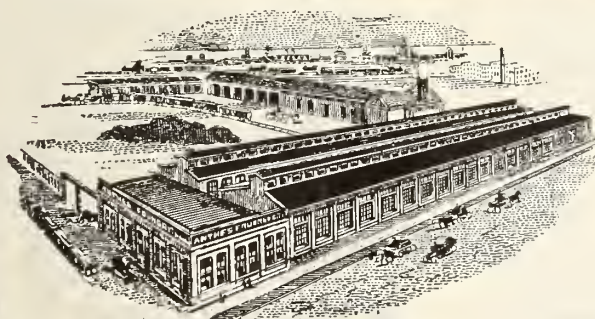
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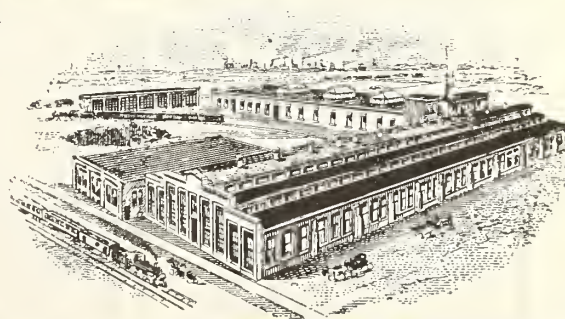
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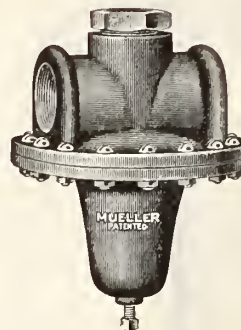
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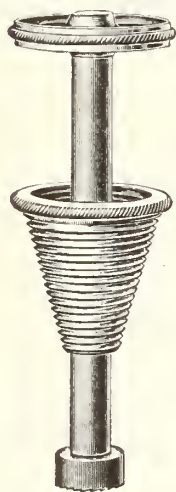
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James Morrison Brass Mfg. Co., Toronto.

Steam Specialties.

G. A. Dunham & Co., Ltd., Toronto.
Mouat-Squires Co., Cleveland.
Honeywell Heating Specialty Co., Montreal.
National Steam Specialty Co., Chicago.
Kerr Engine Co., Walkerville, Ont.
The E. S. Manny Co., Montreal.
Dart Union Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Toronto.

Steam Traps.

E. S. Manny Co., Montreal.

Smoke Test Machines.

James Morrison Brass Mfg. Co., Toronto.

Tools.

Canadian Tap & Die Co., Ltd.
Borden-Canadian Co., Toronto.
Nye Die, Tool & Machine Co., Chicago.
Hall & Sons, Ltd., Brantford.
Armstrong Mfg. Co., Bridgeport, U.S.A.
Williams, J. H., & Co., Brooklyn, N.Y.
Canadian Wolverine Co., Ltd., Chatham.
James Morrison Brass Mfg. Co., Toronto.

Unions.

Dart Union Co., Ltd., Toronto.
Fittings, Limited, Oshawa.

Vapor Heating Systems.

C. A. Dunham Co., Ltd., Toronto.

Vitro Tanks.

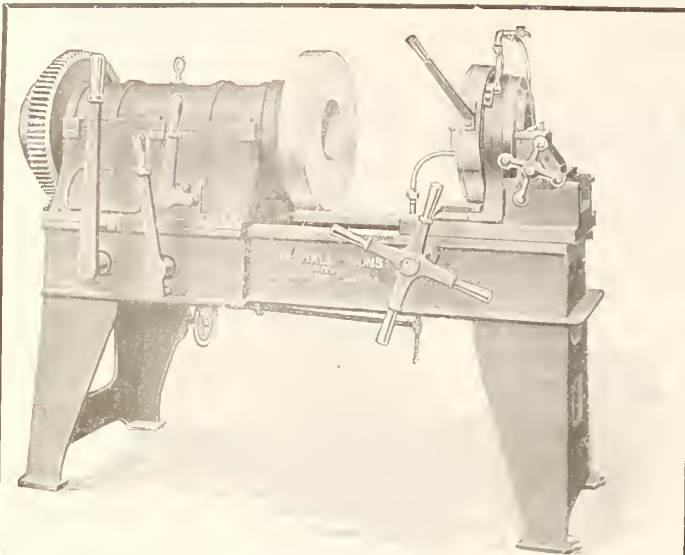
Cluff Manufacturing Co., Ltd., Toronto.
James Robertson Co., Ltd., Toronto.
Cluff Bros., Ltd., Church St., Toronto.

Vacuum Systems of Heating.

C. A. Dunham & Co., Ltd., Toronto.

Water Supply Systems.

National Equipment Co., Ltd., Wabash Avenue, Toronto.
The General Machinery Co., Ltd., Toronto.
Empire Brass Mfg. Co., London.



[MADE IN CANADA]

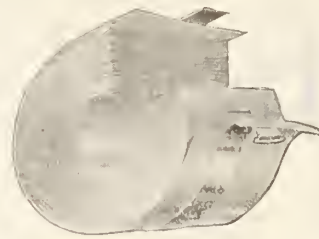
THE HALL NO. 6 PIPE MACHINE

When you buy Hall Machinery you keep Canadians employed. We are a Canadian firm, employing none but Canadian labor. Our guarantees are not at "Long Distance." We are at your door.

Our Machinery is the best that mechanical ability can produce and do not cost as much as imported machinery.

Write us for catalog and prices on pipe-threading lathes, any capacity, from $\frac{1}{8}$ to 18-in., also single and double head rapid nipple machines. No delays, delivery from stock.

JOHN H. HALL & SONS, Limited
BRANTFORD, CANADA



**INCREASE
YOUR PROFITS
ON PIPING
CONTRACTS
BY INSTALLING**

JM**PIPE COVERINGS**

EVERY time you get a contract to install the piping in a building you can make a handsome extra profit by insulating the pipes with J-M Coverings. And you can easily get your customer's order for this covering by pointing out the big reduction it would make in fuel bills and the increase in comfort. We supply facts and figures that make it easy to convince them.

No matter what kind of pipes you are installing—for low or high pressure steam, hot or cold water, liquids, acids or chemicals—there is a J-M Covering exactly suited to the purpose.

J-M Coverings are standard—widely advertised—and in steady demand. Why not benefit by our quality-reputation and service to users?

Write our nearest Branch TO-DAY for "J-M Pipe Covering" Booklets and Special Proposition.

**THE CANADIAN
H.W. JOHNS-MANVILLE CO., LIMITED**

TORONTO MONTREAL WINNIPEG VANCOUVER

**ALPHABETICAL LIST OF ADVERTISERS**

Occasionally advertisements are inserted in the paper after the index has been printed. The insertion of the Advertiser's name in this index is not part of the advertising order.

The index is inserted solely for the convenience of the readers of the paper.

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G		Tallman Brass & Metal Co.	4
Galt Brass Company	Outside Back Cover	W	
General Machinery Co., The	40	Warden King, Ltd.	3
		Williams, J. H., & Co.	39
		Wallaceburg Brass Co.	4

The effect of the Great Conflict

upon business and investment values has been far-reaching. The business man and the investor has never been in greater need of accurate knowledge of conditions — and of the best possible business and financial counsel.

THE FINANCIAL POST of CANADA

through its unexcelled sources of information, and its exact analyses and forecasts, supplemented by its by-mail

INFORMATION BUREAU

which deals with financial or business problems, furnishes a service of unsurpassed value.

Annual Subscription \$3.00 the Year.
Write for a Sample Copy.

THE FINANCIAL POST of CANADA

143-153 University Avenue
TORONTO CANADA

The
Condensed Ad.
page
will interest you

John Wanamaker says that advertising doesn't jerk—it PULLS. He ought to know, and yet some men think that advertising should go against all rules and precedents and jerk them to success with one tremendous yank.

Sani-Flush

A Practical and Economical Remedy
for offensive WATER-CLOSET
BOWLS

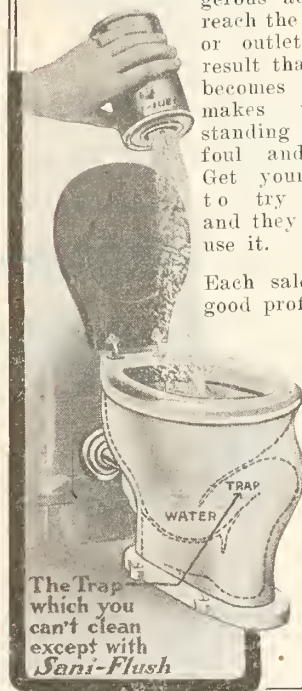


Sani-Flush is poured into the water and forms a solution which loosens the deposit in the trap by chemical action. It cleans the entire water-closet bowl — the seen and unseen parts. Keeps the bowl white as new, sanitary, and odorless. No

scrubbing is necessary.

Perfectly safe to handle and use; cannot injure the bowl or connections. Its frequent use insures a clean and sanitary condition. Scouring, brushing, and the use of dangerous acids fail to reach the unseen trap or outlet, with the result that the latter becomes dirty and makes the water standing in the bowl foul and offensive. Get your customers to try Sani-Flush, and they will always use it.

Each sale brings a good profit.



THE
HYGIENIC
PRODUCTS
CO.

Dept. S.
118 Eighth
Street,
S. E.
Canton,
Ohio



"VULCAN"

Name your choice clearly

Your call in either way is sure to satisfy. Both tools, thoroughly tested before their sale, are bound to supply first-class results when in operation.

"Agrippa" Chain Tools, universally good for both pipe and fittings, have plainly indicated their worthy qualities in all kinds of work. Get one from your dealer and satisfy yourself of its Single-Jaw-worthiness—trial free!

Vulcans set the pace, kept up the pace and always will keep at the pace for all Chain Wrench work.

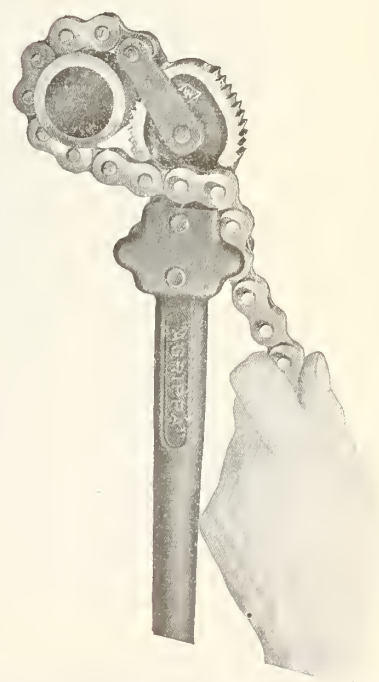
All Tools guaranteed. A choice is simply your declaration of different working-conditions for yourself. In either case perfectly safe and good.

J. H. WILLIAMS & CO.

Superior Drop-Forgings

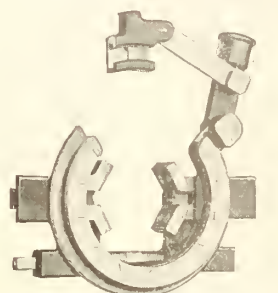
77 Richards St., Brooklyn, N. Y.

"AGRIPPA"

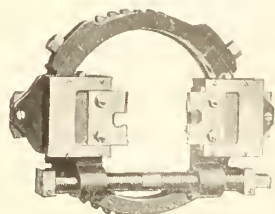


Can you do this with your pipe cutter?

A man using only one hand can cut off a four-inch pipe in four minutes with our 2½-inch to 4-inch Pipe Cutter.



PIPE GRIPPING SECTION



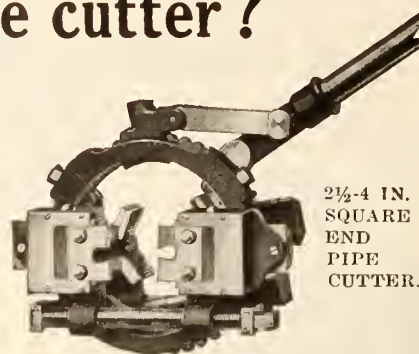
CUTTING SECTION

THE CUT IS PARTICULARLY CLEAN, there being a CONSPICUOUS ABSENCE OF BURRS, inside and outside. Pipe never becomes split or distorted, while the cutter can be quickly adjusted to fit any size from 2½-in. to 4-in.

Will cut through a tread as quickly and squarely as a piece of straight pipe.

As cutting is done by means of a ratchet, pipes may be cut in cramped places, which would otherwise prohibit the use of an ordinary tool.

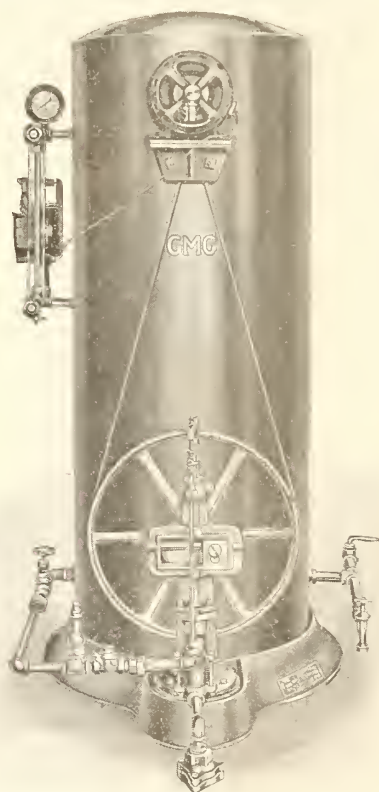
Write for full particulars.



2½-4 IN.
SQUARE
END
PIPE
CUTTER.

THE BORDEN-CANADIAN CO.

TORONTO, ONTARIO



G.M.C. Water Systems

We are now furnishing our "G.M.C. Special" Automatic Electric System, as in cut, with our new Ball-Bearing Pump — Capacity 200 gal. per hour. It is operated by a one-quarter horse-power motor. The Pump itself will supply a sprinkler without the aid of the tank.

This System fulfills conditions which other manufacturers meet with a one-half or one horse-power pump. We save you first cost and cost of power for operation.

THE GENERAL MACHINERY CO., LTD., 22 Mulock St., TORONTO

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

BRONZE

Dart Unions

**Last Indefinitely and
Guarantee Satisfaction**

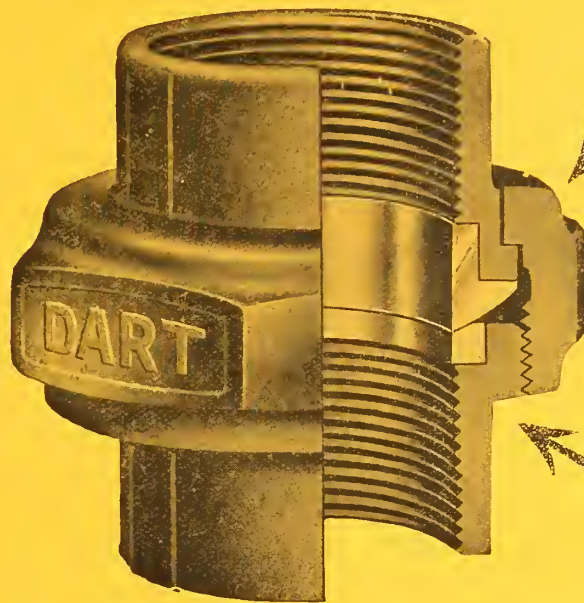
Besides having two bronze (Non-Corrosive) faces, the joint is ball-shaped, which permits perfectly tight CONNECTIONS TO BE MADE EASILY AND QUICKLY WHETHER PIPES ARE IN OR OUT OF ALIGNMENT.

The heavy iron parts are not affected by expansion, contraction or vibration.

We guarantee the Dart Union to do all we claim for it—and will promptly replace it with TWO new ones if it is not right.

Your jobber has them.

Manufactured by
Dart Union Company, Ltd.
TORONTO



**No
Deterioration
Here**

BRONZE

KERR GATE VALVES

NOW IS THE TIME to show your patriotism, and prove to yourself and others, that VALVES, made in Canada, are equal in quality and workmanship, to any made elsewhere in the World.

**BREAK THE
HABIT** of buying foreign-made goods and get acquainted with Canadian Made valves, which you have perhaps imagined were not quite equal to the Imported variety.



REMEMBER that every dollar spent in Canada for Canadian manufactured goods, means increased consumption of raw materials, and increased employment of Canadian labor.

Quickest possible deliveries.

Consistent Prices.

This plant is at your service.
Help us keep it busy.

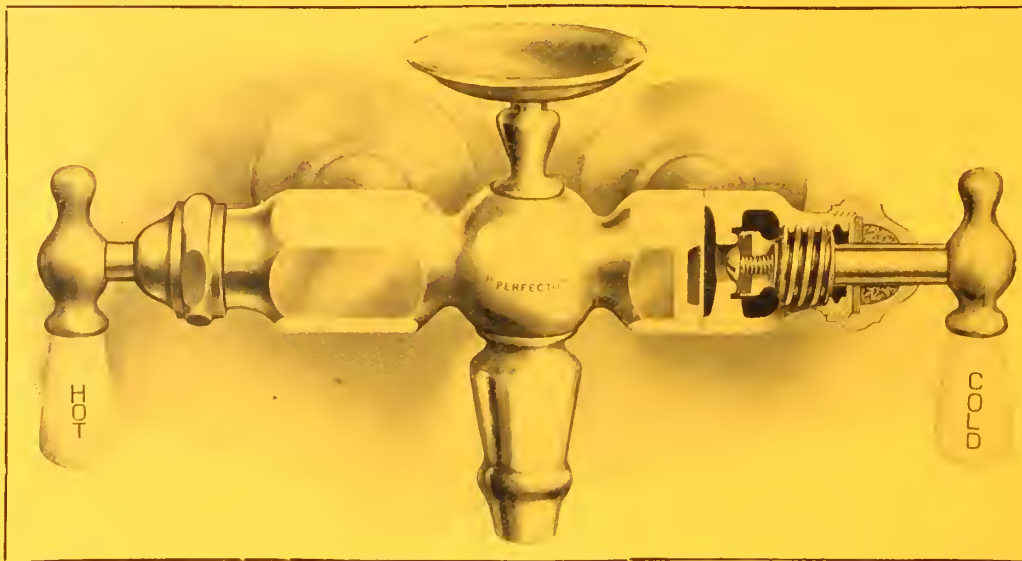
Write for Catalog No. 5.

Best quality of goods.

The Kerr Engine Company, Limited Walkerville, Ontario
Valves and Hydrants Exclusively

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

GALT BRASS Co. LIMITED



"PERFECTO" (REG. 1913)

Use the "Perfecto" when in a hurry—
Saves half the time and all the worry.

THE **"PERFECTO"** BATH COCK is a modern achievement in the quick-pressure or rapid-opening type, giving you lever action, and largest waterway made, coupled with a very attractive design.

HIGH-GRADE
BRASS
AT
MODERATE PRICES

Guarantee

ANY ARTICLE OF OUR
MAKE, PROVING DEFECTIVE
THROUGH INFERIOR METAL
OR IMPROPER WORKMAN-
SHIP ON OUR PART, WILL BE
REPLACED WITH TWO GOOD
ONES AT **NO CHARGE** TO YOU.

GALT BRASS Co. Limited

A
COMPLETE LINE
OF
PLUMBERS' SUPPLIES

GALT BRASS CO. LIMITED

GALT, CANADA

REPRESENTATIVES :

Alberta
Ontario
Quebec
Toronto

L. McKenzie
T. H. McLaren
Auguste Comte
R. S. Alexander

Phone M. 5810
" 424L
Phone St. Louis 1147
" J. 4950

Calgary
Galt
Montreal
Toronto

Maritime Distributors:
Wm. Stairs, Son & Morrow, Ltd., Halifax

THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

Vol. VIII.

Publication Office : TORONTO, DECEMBER 15, 1914

No. 24

Standard
Ideal

"Made in
Canada"

Enameled Iron Sanitary Ware

"Made in
Canada"

A boost to-day for Canadian Industries will provide to-morrow's necessities and comforts for Canadian workmen and their dependents.



THE LARGEST EXCLUSIVE CAST IRON ENAMELING
SANITARY WORKS UNDER THE BRITISH FLAG.

HIGHEST QUALITY — MERIT — DESIGN — MADE IN CANADA

These are our arguments in favor of our products
and for a larger share of your business.

The Standard Ideal Company Limited

General Offices and Factories, Port Hope, Canada

TORONTO
119 King St. East

MONTREAL
42-44 Beaver Hall Hill

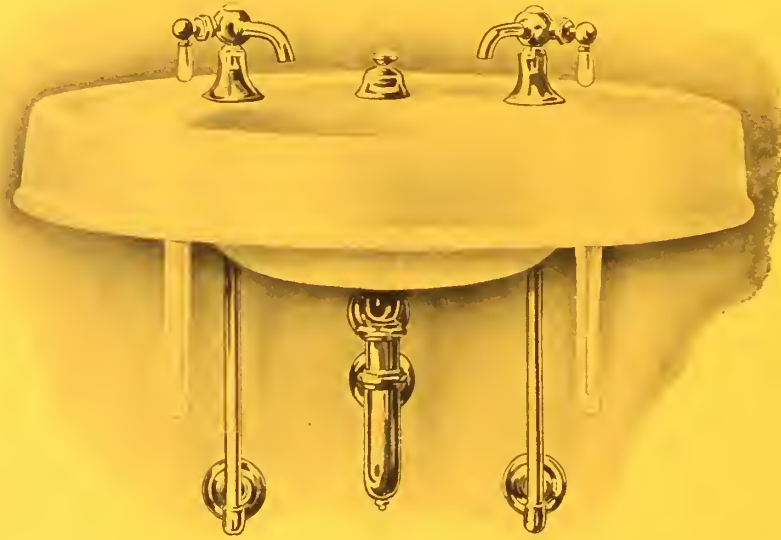
WINNIPEG
76-82 Lombard St.

VANCOUVER
410 Carter Cotton Bldg.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.

These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

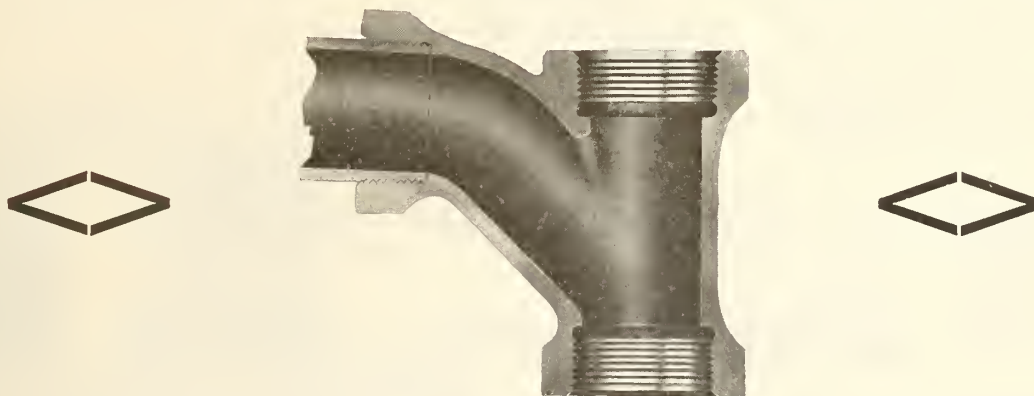
ONTARIO:
Monarch Brass Mfg. Co.,
178 Victoria St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes,
120 Lombard St., Winnipeg

BRITISH COLUMBIA:
A. O. Campbell,
864 Cambie St., Vancouver

RECESSED DRAINAGE FITTINGS

**We are now Manufacturing
a complete line**



FITTINGS LIMITED OSHAWA

MONTREAL

WINNIPEG

VANCOUVER

KINDLY NOTIFY US!!

IF YOU KNOW OF A
B-O-T OUTFIT
THAT IS
OUT OF ORDER
AND WATCH US
LIVE UP TO
OUR

5-YEAR GUARANTEE

Always look for the  Trade-Mark.
It insures your job.

The B-O-T Manufacturing Company, Limited

B-O-T Building, 159 Richmond Street West, Toronto

Montreal Office : 68 Beaver Hall Hill

Winnipeg Office : 405 Tribune Building

Made in Canada



For over 40 years
Jenkins Bros.' Valves
have made good



Fig. 117
Brass Horizontal
Check Valve
Screwed
Standard Pattern



Fig. 106
Brass Globe Valve
Screwed
Standard Pattern

Forty years of constant study and
manufacturing experience have kept
JENKINS BROS.' VALVES in the
lead for **Quality** and **Service**

Catalogue mailed free upon request

JENKINS BROS. Limited

103 St. Remi St.

Montreal

**JENKINS BROS.'
Valves**
Excel all others
in **ECONOMY,**
STRENGTH
and
EFFICIENCY

Get them at
your dealers.

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

THE DAISY BOILER

Over 55,000 DAISY Boilers

are giving the best of service throughout Canada.

The Daisy has qualities which make it a better proposition than any other on the market.



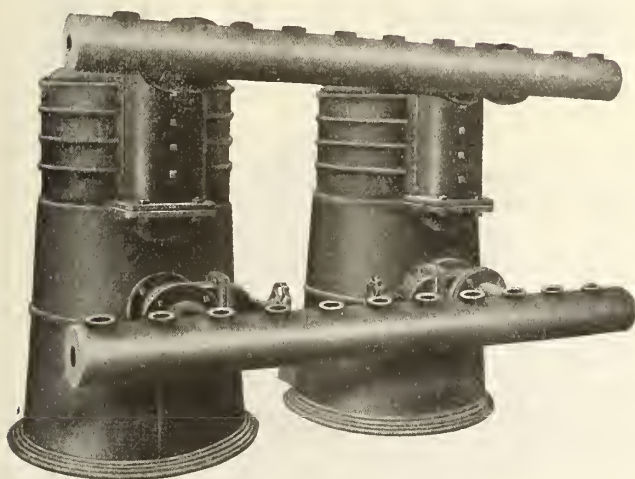
Made in the best equipped plant in Canada.

Without doubt the most popular boiler made.

Every installation means another customer satisfied.

Minimum consumption of fuel.

Maximum amount of heat.



Rear view of two Daisy Boilers connected with twin headers. This system gives great satisfaction in mild and extreme weather.

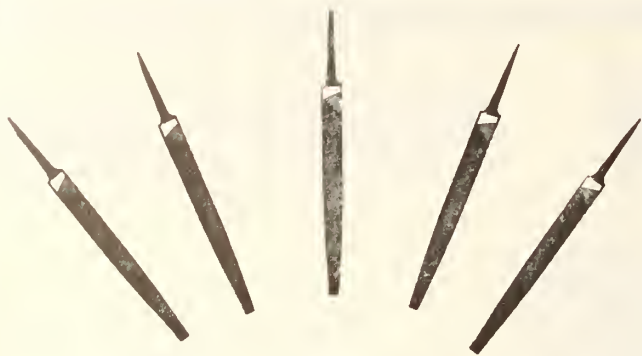
WARDEN KING LIMITED, MONTREAL

BRANCH, 200 Adelaide St. West, TORONTO

AGENTS:

The CRANE & ORDWAY CO., WINNIPEG, MAN.
The MECHANICS' SUPPLY CO., Limited, QUEBEC, P.Q.
The JAMES ROBERTSON CO., Limited, ST. JOHN, N.B.
The WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."



The Same

Yesterday
To-day
To-morrow

It's a waste of time and money to "break in" different makes of files. The wisest way is to standardize your files. To use only

KEARNEY & FOOT GREAT WESTERN AMERICAN ARCADE GLOBE

Made in Canada

These famous files never vary in quality or "cut." Every step in their making is under our control. From furnace to file, we direct every operation.

That's why deep "cut"—perfect work—and splendid balance—distinguish all Nicholson-Made-Files.

4,000 patterns—
50 years' experience—
60,000,000 output annually—
mean the right file—at the right price.

It "costs less to use more." It's cheaper to use two new files than to wear an old one out.

NICHOLSON FILE COMPANY
PORT HOPE Dealers Everywhere ONTARIO

"FILE PHILOSOPHY" is the most interesting little booklet ever written on files. A free copy and our catalog are yours for the asking.

300,000 lbs.

carried in stock for immediate
shipment of

Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

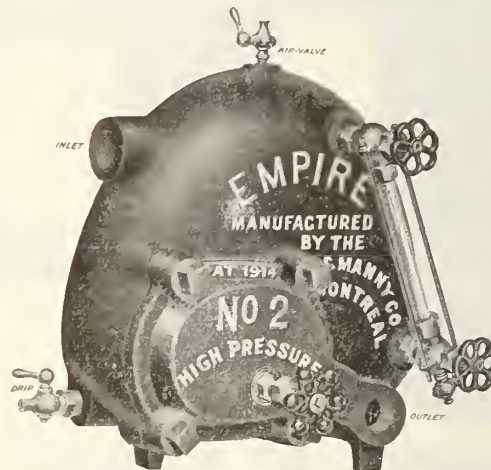
Brass and Copper Rod.

Brass and Copper Sheet.

WRITE US FOR PRICES

Tallman Brass & Metal Co.
HAMILTON, ONT.

EMPIRE STEAM TRAP



**Valve Area is Increased and Capacity Nearly Doubled
by Means of**

a counterbalance lever which also increases its sensitive action in discharging the water.

CONTINUOUS IN OPERATION

No screws to adjust for different pressures. Requires no attention.

No stuffing boxes to prevent the free working of the lever. The "Empire" has a plug valve made of phosphor bronze that will not stick or become clogged with dirt.

Copper floats are seamless, made by a new process, and cannot be collapsed.

We know by experience that this is the cheapest, the most reliable and perfect working trap on the market.

A trial will convince you.

THE E. S. MANNY COMPANY
MONTREAL Representatives Wanted. CANADA



OSBORNE HOUSE, ISLE OF WIGHT
FORMER RESIDENCE OF THE LATE QUEEN VICTORIA OF ENGLAND



ROYAL PALACE OF LA MAGDALENA
SUMMER RESIDENCE OF THE KING AND QUEEN OF SPAIN



SANDRINGHAM HOUSE
COUNTRY RESIDENCE OF THE KING AND QUEEN OF ENGLAND

Royal Palaces in which "Standard Sanitary" Plumbing Fixtures were installed—a few notable examples of their world-wide popularity

"Standard Sanitary" Plumbing Fixtures can be obtained anywhere in the Dominion. They are handled by leading Plumbers throughout the provinces and are carried in stock by Jobbers and Sales Agents throughout the Dominion of Canada, thus facilitating prompt deliveries.

Standard Sanitary Mfg. Co.

Limited

General Offices and Factory: Royce and Lansdowne Aves., Toronto, Ontario

TORONTO STORE

55-59 Richmond Street, West

HAMILTON STORE

20-28 Jackson Street, West



BALMORAL CASTLE
SCOTTISH RESIDENCE OF THE KING AND QUEEN OF ENGLAND



THE QUIRINAL
OFFICIAL RESIDENCE OF THE KING AND QUEEN OF ITALY, ROME



BUCKINGHAM PALACE
OFFICIAL RESIDENCE OF THE KING AND QUEEN OF ENGLAND, LONDON



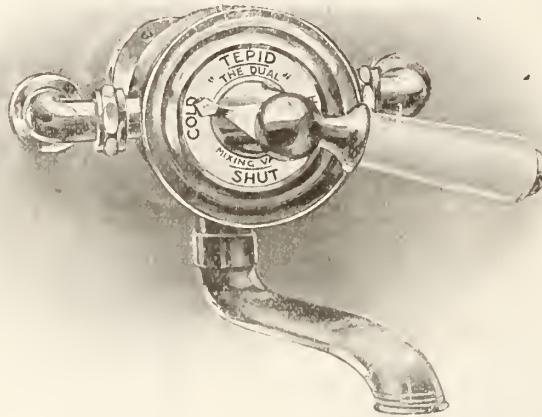
PALACE OF THE KING OF THE BELGIANS
BRUSSELS

"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

Messrs.
BRUNNER, MOND
& Co., ENGLAND,
Have the finest Industrial Bath Installation in Europe.

**OVER 2000
EMPLOYEES**
are provided for.
This is the Valve
used.
Made in England
by GUMMERS Ltd.,
ROTHERHAM

THE **DUAL** VALVE IS THE FINEST MIXER YET PRODUCED



This Mixer is strong and well built.

It can be taken to pieces without disturbing connections. Made in various types for Baths, Lavatories, etc.; also special stock pattern with one or two outlets at option for making up sets.

Send for booklet to

Geo. Carpenter,
314 University St.,
Montreal!
Canadian Agent

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal

Works: Lachine Canal

Talking to the Point—

CLASSIFIED ADS. get right down to the point at issue. If you want something, say so in a few well-chosen words. Readers like that sort of straight-from-the-shoulder-talk, and that is the reason why condensed ads. are so productive of the best kind of results.

CLASSIFIED ADS. are always noticed. They are read by wide-awake, intelligent dealers, who are on the lookout for favorable opportunities to fill their requirements.

TRY A CONDENSED AD. IN THIS PAPER.

COMPRESSION BATH COCK

Fuller Pattern—China Index Handles



As easy to operate as a regular Fuller.

Note:—Beauty of design and construction.

The handsomest and best bath cock on the market.

Furnished with brass handles also if so specified.

Made in Canada.

Price Reasonable.

Nough Said.

Manufactured by

Canadian Wolverine Company, Limited
CHATHAM, ONT.

Our Large Variety of Floor and Ceiling Plates

enables our customers to buy anything they desire, and we can make special plates of any kind on short notice.

300,000 ALWAYS ON STOCK in sizes from 3/4 to 4 inches.

Our No. 10 Hinged Pressed Steel or Brass is our most popular plate.

WE MANUFACTURE EVERYTHING THE SANITARY ENGINEER NEEDS.

The BEATON & CADWELL MANUFACTURING CO.

New Britain, Conn.

Eastern Agent: J. R. Devereux, 142 St. Joseph, Boulevard West, Montreal.

Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

Gas Companies and the Public demand a Strong, Durable Gas Mantle with a high candle power, and at popular prices. The Trade can now absolutely rely upon being able to supply such a mantle in the Laddite.

Awarded Gold Medal
Franco-British
Exhibition
1908.

Mantles made and supplied for oil, gasoline, air gas, acetylene, and light-houses.

THE STAR OF THE MANTLE WORLD

LADDITE

The Mantle HARDENS and INCREASES in Candle Power as it burns

Full particulars of the merits of the Laddite, together with terms for wholesale and retail trade, furnished on application.

Millions of Laddite Mantles now in use throughout Great Britain and abroad.

Manufacturers under the "Laddite Process."

The Hamilton Gas Mantle Co.

LIMITED

18-24 Ferguson Ave. N., Hamilton, Ont.

SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, DECEMBER 15, 1914

No. 24

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The MacLean Publishing Co., Limited

JOHN BAYNE MACLEAN, *President*
T. B. Costain, *Managing Editor*

ESTABLISHED 1883

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SANITARY ENGINEER, PLUMBER and STEAMFITTER of CANADA

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Chas. W. Byers, *Associate Editor*

Published on 1st and 15th of each month. Subscription, Canada, \$1.00; United States, \$1.50; Great Britain and the Colonies, 4s. 6d.; Elsewhere, 6s.

Cable Address: Macpubco, Toronto; Atabek, London, England.

CHIEF OFFICES:

CANADA—Montreal, 701-702 Eastern Townships Building; Toronto, 143-149 University Ave., Telephone Main 7324; Winnipeg, 34 Royal Bank Building, Telephone Garry 2313.

GREAT BRITAIN—London—The MacLean Company of Great Britain, Limited, 88 Fleet Street, E.C. E. J. Dodd, Director. Telephone Central 12960. Cable Address: Atabek, London, England.

UNITED STATES—New York, R. B. Huestis, 115 Broadway, N.Y., Telephone Rector 8971; Chicago, Ill., A. H. Byrne, 140 S. Dearborn Street, Telephone Randolph 3234; Boston, C. L. Morton, Room 733, Old South Building, Telephone Main 1024.

NO
JOINTS
TO
OPEN UP

VITRO
NO TROUBLE

NO
LININGS
TO
LEAK

Closet Tanks

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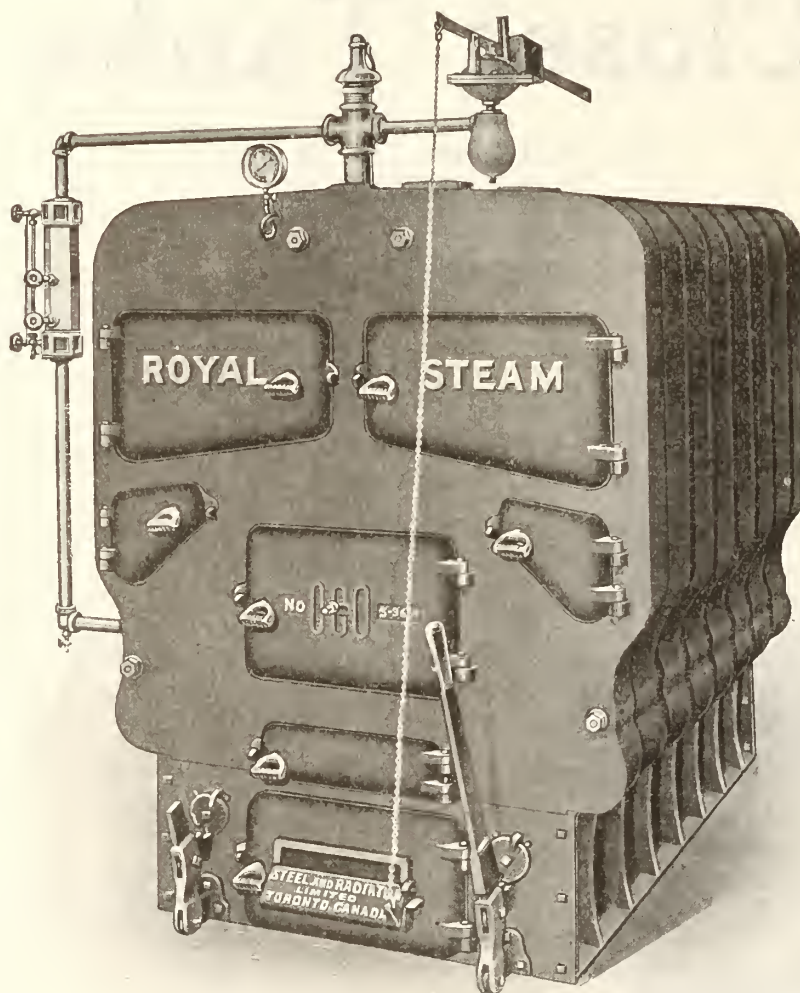
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THE SANITARY ENGINEER

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DECEMBER 15, 1914.

No. 24

Simplified Sanitary Engineering Methods

Showing That to Simplify the Construction of Piping is More to Be Desired Than Multiplicity of Piping—The Latter Does Not Necessarily Increase the Efficiency.

By Dr. Wm. Paul Gerhard, S.E., New York.

ALL these experiments agreed in showing that there was no appreciable difference when the top of the vertical pipe line was enlarged, and that a reduction line was enlarged, and that a reduction always had an unfavorable effect. These tests practically confirm the rule requiring pipes to be extended at least in full size, and showed that an enlargement is desirable to counteract in winter time any possible reduction of the section area of the pipe mouth by hoar frost or icicles.

The results of the experiments are summarized as follows:

The "back-airing" of traps may be dispensed with provided the following conditions are observed:

1. The cross-sectional area of the waste or soil pipe must be larger than that of the trap. For a 1½-inch (40mm.) trap the waste pipe should be two inches (51mm.), for a two-inch trap it should be about 2½ inches (60mm.).

2. The trap must be set close under the fixtures and must either connect directly with the Y-branch of the vertical waste or soil pipe, or if they are not more than 1 metre (3 ft. 3 in.) distant

from the vertical ventilated pipe the horizontal branch waste must be increased in size.

3. The traps must have a depth of water-seal of four inches (100mm.).

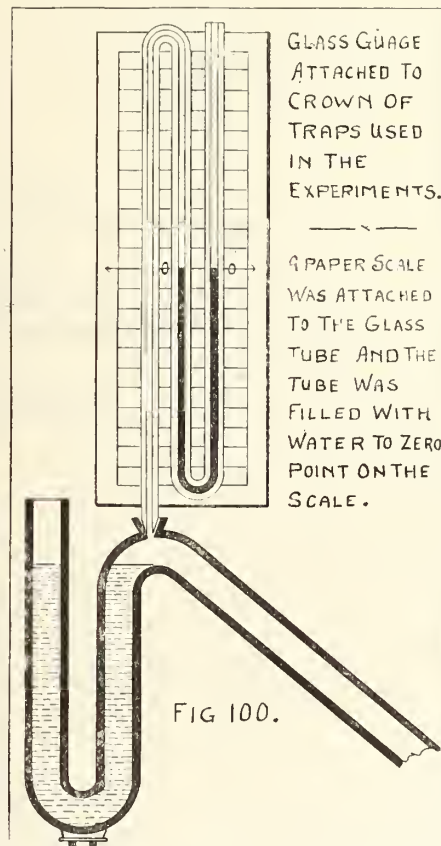
of the pipe; a wire basket may be used, the openings of which must be at least equal to the sectional area of the pipe. (Fig. 101.)

* * * * *

In other experiments made a horizontal or graded waste pipe of 51 mm. diameter (two inches), connected with the vertical line; it had three fixtures connected to it by means of Y branches. (See Fig. 96.) The fixture traps were made interchangeable and had 40, 60, 80 and 100mm. water-seal. The distance of the three fixtures from the vertical lines were 2, 3 and 4 meters (6.6; 9.9 and 13.2 feet). The three fixtures were either discharged simultaneously or used singly, while the other two were closed. These experiments were made to determine the influence upon siphonage which the various distances from the vertical line had. The influence which various inclinations of the lateral branch had was ascertained by placing the waste pipe under inclinations of 1 in 40, 1 in 20, 1 in 10, 1 in 5, 1 in 2 and 1 in 1. The summary of the results of these experiments is as follows:

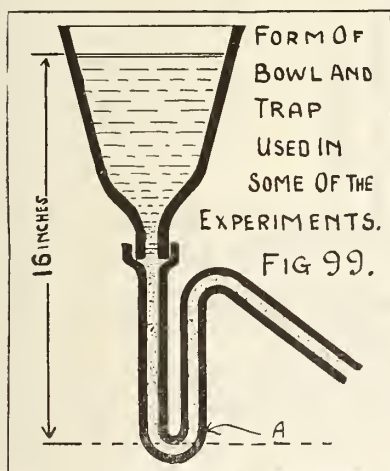
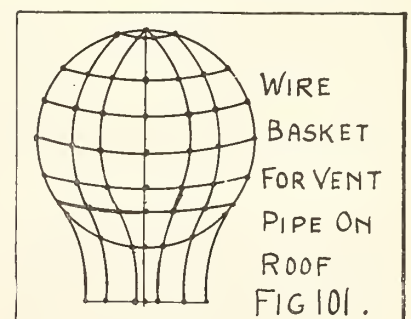
1. Where the distance of a fixture from the nearest vertical ventilated line exceeds 1 metre (3.3 feet) the trap must be vented, unless the horizontal waste pipe is made 10mm. or about ½ inch larger, and unless the trap fulfils requirements three and four above given.

2. A single fixture connected with the main horizontal sewer through a ver-



4. The combined area of the openings in the strainer of the fixture must not be greater than 50 per cent. of the cross-sectional area of the trap.

5. Vertical soil or waste pipes must be carried in full size, with as few offsets as possible, to a point above the roof; it is even better to enlarge the pipes two inches, from a point twenty inches (50cm.) below the roof; the minimum size of roof vent pipes to be four inches (100mm.); no ventilating cap or return bend to be put on the top



Figs. 99 and 100 were referred to in Dec. 1st issue.

tical waste line, does not require a vent, but it should have a gate valve in the waste may be regarded as sub-mains, off the fixture prolonged disuse and to guard against evaporation.

3. When two or more fixtures discharge into a horizontal or inclined lateral waste, it is not necessary to "back air" the traps of each, provided the above conditions three and four are fulfilled, when the main lateral waste pipe is a size larger than the fixture waste, but it is necessary to extend the uppermost end of the lateral waste upward through the roof. Such lateral waste may be regarded as sub-mains, which of course always require ventilation. When the conditions cannot all be fulfilled, the back-venting of traps may be desirable to prevent siphonage.

Similar experiments were made with the second line (2½ and four inches in diameter respectively), fixture traps being connected to the same and the action of the traps observed while larger volumes of water were poured through the vertical pipe line. It was assumed that the vertical line represented a leader pipe, and that 100 square meters (or about 1,000 square feet) of roof surface could be drained by a 2½-inch leader, and 200 square meters (about 2,000 square feet) by a four-inch leader. A rainfall of 100mm. (2.5 inches) per hour yields 0.28 liters (0.01 cubic feet) per second per 1,000 square feet, and double this quantity on 2,000 square feet. The water poured through the 2½-inch pipe corresponded to ½, 1 and 2 liters per second, or 18.36 and 72mm. rainfall per 1,000 square feet, and to 1, 2 and 4 liters per second through the four-inch pipe, or the same amount of rainfall per 2,000 square feet.

In the experiment with a 2½-inch vertical line a flow water corresponding to ½ liter per second did not affect the trap seal; a flow of 1 litre per second siphoned the trap completely. The same happened, of course, with a flow at the rate of 2 liters per second.

The same volumes poured through the vertical four-inch pipe reduced the seal of the trap when the flow was at the rate of 1 liter per second, and siphoned it out completely when the rate was 2 liters per second.

It follows from this that it is not permissible to connect fixtures with rain-water pipes. When any are so connected, the traps must have a seal of at least four inches, and even then it is better to vent the trap to prevent siphonage.

The second vertical line was then made, first four inches in diameter, and subsequently five inches, and used to connect water closet traps. Each branch was made four inches, and the distance from the centre of the water closet was made 3.3 feet (1 meter). The water

closet traps had one and two inches of water-seal. The amount of flushing water poured through them was 15 liters, or nearly four gallons. The results were as follows:

1. Water closet traps with a seal of 25mm. (one inch) always require vent pipes, even where the soil pipe is made five inches (130mm.) in diameter.

2. Water closet traps with a two-inch water-seal require venting when the size of soil pipe is equal to that of the trap. They must also be vented if they are more than 1 meter (3.3 feet) away from the soil pipe, whether the latter is larger than the trap diameter or not.

Back-air pipes for water closet traps can therefore be omitted only when the water-seal is two inches or more, when

the closet is within 3.3 feet of the ventilated soil pipe, and when the latter is at least five inches in diameter. With a soil pipe four inches in diameter a back-air pipe is necessary. It should be stated in this connection that no experiments were made with siphon and siphon-jet water closets having a seal of three or four inches, and the reason given for this omission is that the closets usually fitted in Cologne have the old-fashioned whirl flush, which does not keep traps clean when they have extra deep seal. It is to be regretted that further experiments were not made with siphon-jet closets, as the latter would without doubt have modified the conclusions reached by the experimenters.

(Concluded in next issue.)

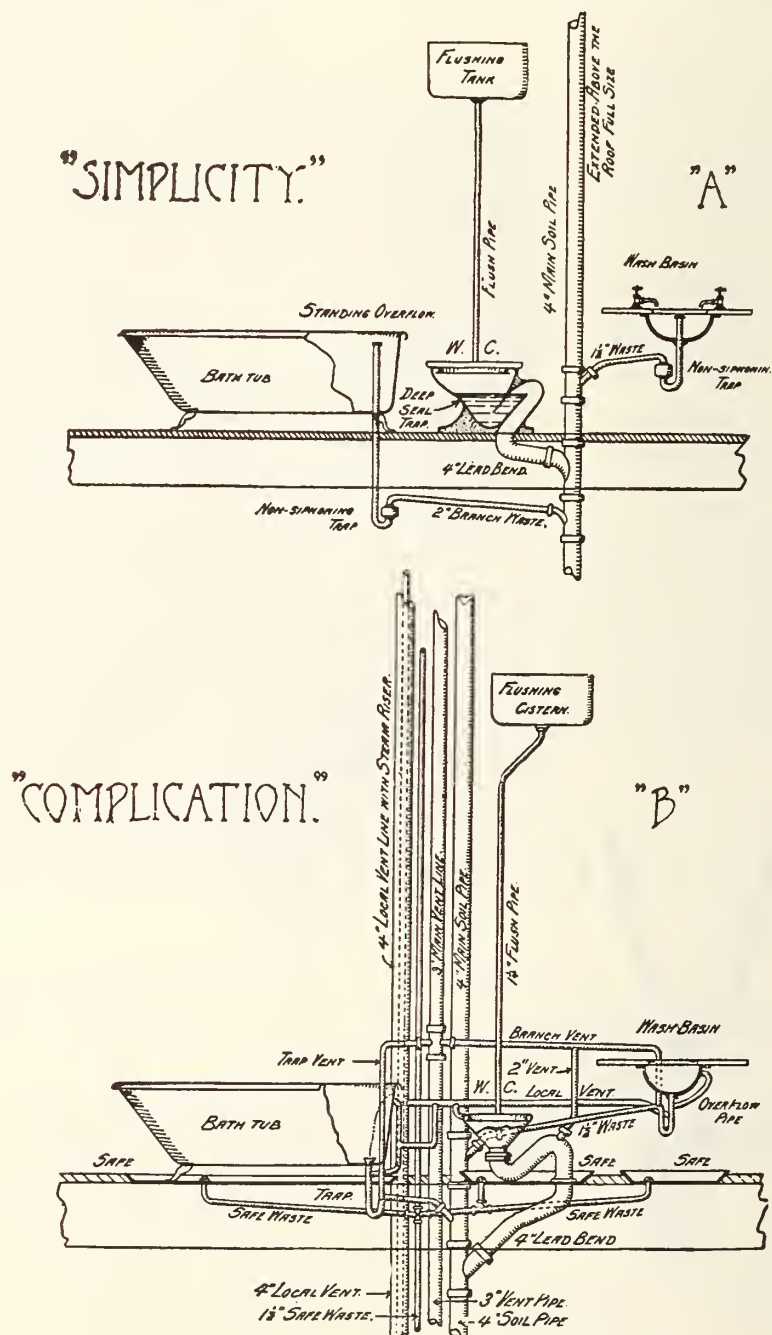


Plate VI.—Sections of complicated and simplified plumbing work.

Analysis of Can. Sanitary Engineering By-laws

Commenting Upon the By-law Known as By-law No. 528, Governing Sanitary Engineers and Sanitary Engineering Construction in the Town of Waterloo, Ontario.

(Continued from last issue.)

THE clauses we will comment upon in this issue will be found to be of particular interest to our readers, because they show that Waterloo is, to say the least, a little more up-to-date than some cities in Canada.

Clause 23.—No lead waste or vent pipes shall weigh less than the following:

1	inch in diameter	.....	2	lbs. per lineal foot.
1 1/4	" " "	.....	2 1/3	" " " "
1 1/2	" " "	.....	2 2/3	" " " "
2	" " "	.....	3 1/2	" " " "

sized school, but Waterloo is a very promising town, and has some fairly large industries, which we feel sure would require a large main pipe from sewer to top. Top of what? We suppose it is meant to read "To top of roof."

Clause 26.—No trap or other obstruction to the free flow of air

through the whole course of the house sewer and soil pipe shall be placed on soil pipe or house sewer.

Clause 26 is of particular interest, seeing that the question of the main house trap has been discussed at great length in The Sanitary Engineer throughout the whole of the year, and, while there are said to be quite a few members of the craft in favor of the main house trap, not one has come forward and given any reasonable excuse

(Continued on page 16.)

It will be seen that clauses 21, 22, and 23, are general. We do not however, see any reason why, one inch lead waste pipe is mentioned in clause 23, as no waste or vent pipe less than 1 1/4 inch should be allowed.

Clause 24.—Every connection with lead or iron pipes shall be made with brass thimbles or ferrules, having properly wiped joints and the ferrules having been properly gasketed, leaded and caulked with the said pipe. Ferrules for four-inch pipes shall not weigh less than two and one-half pounds, for three-inch pipe not less than one and three-fourths pounds, and for two inch pipe not less than one and one-half pounds, each ferrule not to be less than four inches in length.

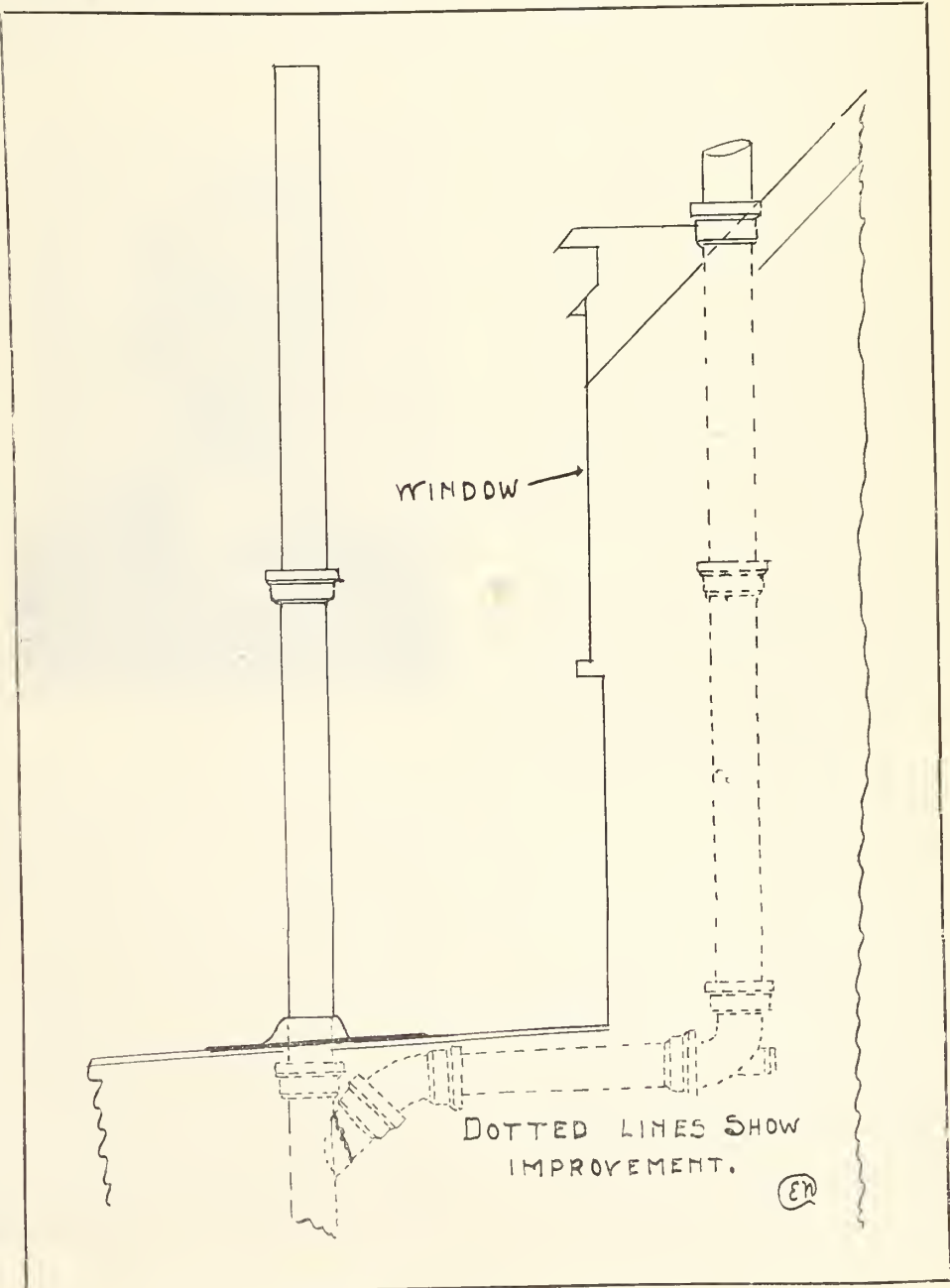
This clause might be much clearer. The wording may mean almost anything. What should be demanded is, that all connections between wrought iron pipe and lead pipe shall be made with brass solder nipples or thimbles wiped into the lead pipe, and all connections between cast iron and lead with first by wiping a brass ferrule to the lead, and properly caulking the ferrule into the hub of the cast iron pipe or fittings.

We have no fault to find with the rest of the clause.

Soil Pipes, Waste Pipes, etc.

Clause 25.—The main pipe from the sewer connection to the top shall be fully four inches in internal diameter at every point.

The above clause is good so far as it goes, but we would strongly recommend that some provision be made which would limit the number of w.c.s., etc., on a four-inch drain, soil or waste pipe. It would appear that an unlimited number could be placed on this sized pipe. Of course, it may be large enough for any ordinary building and moderately-



Sanitary Engineers and Gas Heater Salesmanship

Dealing With the Problem of Gas Water Heater Sales, Showing How Sanitary Engineers May Build up a Very Profitable Department, and One Which Would Tend to Increase the Demand in Other Lines.

By H. S. Powley,
Late with Consumers Gas Co., Rund Mfg. Co., and James Morrison Brass Co., Toronto.

If you go to the proper authority in any Gas Company, either in United States, England or Canada, even to The Consumers' Gas Company of Toronto, and ask the question—"What gas appliance holds the most important place in your sales records?" the answer will be "Gas Water Heaters." That is a fact, nevertheless, and somewhat remarkable when you consider the vast volume of business transacted daily in the sale of gas illumination goods, ranges, grates, and other appliances using gas fuel. Analyze this fact out and you will doubtless arrive at the conclusion that the sale of a gas water heater involves material, some labor, all the result of a salesman's work, and that such an appliance is more or less indispensable in the modern household of the present day. Invariably the sale of a gas water heater will bring other valuable business with it, particularly if the heater is a good one, is efficient, and properly installed. I could cite innumerable cases where the sale of such a heater at from \$16.00 to \$25.00 complete, has brought business that would otherwise have been undeveloped, but for the satisfaction obtained and the ideas created of where gas fuel would work out to advantage for other purposes.

A few figures dealing with the annual business done in the sale of gas water heaters by large gas companies (not to belittle the smaller companies by any means) will be of interest. You will appreciate first, however, that the reference to the gas companies is not to depreciate your share in this work, but is used as a comparison, that later on will be covered in the right way. It is impossible for me to give absolutely correct figures, the possibility of getting such information is more or less of a confidential nature with such concerns, but the figures given are known to a few, and here they are. The largest gas company in the world is The United Gas Light Company of Philadelphia and Holding Companies. They sell annually gas water heaters to the number of 20,000 and upwards. These heater sales are of different well-known makes that each year must pass the regular efficiency tests conducted by the company, the heaters costing from \$6.00 to \$13.50

each, depending upon the capacity. We will not use up space discussing the English situation, for the sales made there will in no way assist me in this comparison of conditions—suffice it to say that the sales of American built heaters are being sold more extensively in the Old Country than ever before. We are all somewhat in touch with the situation in Toronto and to make the subject clear will use the local company as a basis for future comparisons in this article. The Consumers' Gas Company, up to five years ago, had done little in the furthering of gas appliance



H. S. POWLEY.

sales, confining their business chiefly to the making and sale of gas. Some years ago they purchased and sold several gas ranges, but until that time no great encephalon between their overhead expense and effort was put into this work. Due to organization, publicity, and in other ways, they have worked up a splendid business, and their yearly sales of gas water heaters average 2,000, ranging from a limited installation of \$17.60 for the regular standard 25 foot double copper coil heater to an average outside cost of \$22.50. All this business is being transacted at a good profit, and they are undoubtedly an A1 example of a Public Utility Corporation creating and

supplying a demand for gas appliances at a fair cost to the consumer.

Did you ever stop to figure out just what profit the Gas Company make on the sale of a gas water heater on the limited installation basis? You can buy various makes of gas water heaters of the regular 25 foot coil types from \$7.00 to \$8.00, and their cost is very little less than your cost, just a few cents lower, but we will fix the cost at the latter figure as a basis. My knowledge of the business has proven that \$4.00 is the limit of expense for installation of a first-class job (of what you all understand as a limited installation) which makes the total outlay amount to \$12.00, and this subtracted from the sale price leaves a gross balance of \$5.60. Overhead expenses, including your supervision of the work, insurance, taxes, interest on money invested, and other details of this nature we will fix at 25%, amounting to \$1.40 or a net profit of \$4.20. If you will estimate the difference of the gas company which is a little greater than that allowed, you will find that your net profit is nearer the even Five Dollars than the amount shown. Now, to mention the Consumer Gas Company again, in spite of the vast system to maintain and the consequent cost as against that of your own business, they are making a good profit out of the sale of such heaters, and are using every means to further such business and maintaining likewise a very high standard of workmanship. A job well done in the first instance will cost much less than to be obliged to return and make some simple alteration to make it satisfactory, not to mention the argument that naturally follows between you and your customer.

Need I dwell even for a moment to compare an ordinary contract job amounting to say \$500.00 with the same amount of cash invested in gas water heaters, material and labor? Your limit of profit nowadays on contract work is at the outside 20% (which is unfortunately not a fair living margin) and you cannot charge your time supervising the work, and running between architect, client and job, it would prove interesting, and somewhat of a revelation in fact, when you really figure this stu-

ation out. It is not my intention to belittle the contract work, for that plays an important part in your daily business affairs, but to show that the average sanitary engineer belittles the profits and available business in gas water heater orders, largely because at first glance a contract looks more to him than the sale of a heater at such a small final cost.

You may never have figured out the gas water heater question just in this way. You buy a heater to-day on an order secured yesterday, obtaining thirty days on the heater, thirty days on the cost of the piping, etc., and at an average of a fortnight for wages. It is safe to say that the average purchaser will settle within the ten day limit for his heater, or in the extreme within the month following purchase, and taking the matter either way you operate this class of business, you do so almost entirely on your customers' money. The value of this business is too important for you even to place it in a secondary class. I can name you several prominent firms in the City who are paying rent, other overhead costs or important expenses of this nature out of the profits derived from the sale of gas water heaters, and who attach every importance to this branch of their business, and follow it diligently.

Let me give you an illustration, though it has nothing directly to do with the business under discussion, but the example is very good nevertheless. A certain retail tobacconist in Toronto, who has been engaged at the business for a number of years, and who has grown wealthy from his earnings, obliged me the other day with the reason for his success. When he decided to start in the business he had about \$1,600.00 capital. After leasing premises, installing fixtures and a moderate stock, a balance of a little over \$150.00 was left him. For many months his trade was hardly fair, the merchants on more prominent thoroughfares getting all the transient trade and holding their regular customers. One day an enterprising wholesaler approached my friend and offered to sell him T & B Plug at 18½¢. provided he paid the cash and took the goods away with him. He had been buying the same goods on credit for 22¢. Retail price was 25¢. This purchase arrangement made more profit, but still his trade was not increasing satisfactorily, and conditions necessitated a change in his methods or failure of his ambitions. The idea of why he made the change from the credit wholesaler to the cash wholesaler excited a new train of ideas. He bought a goodly stock of the plug at 18½¢, advertised and sold it for 18¢., losing the ½¢. on each plug sold. For some time matters were not

improving very rapidly though a few new faces began to appear daily. Finally, however, his trade took a sudden bound, and along with the sale of the plug at the cut price, other goods started to move and gradually he was weaning away regular customers from other stores and supplying the plug customers with all of their smoking necessities. To-day he has a fine trade, carrying his business along at from 3% to a 5% profit, but turning the money over many times a year and on standard lines as much as six and seven times annually. My moral in this illustration is that the greatest profit is not always in the orders amounting to three and four figures, that people will not come to you without some good reason, that original plans must be laid and scrupulously carried out, and absolutely just treatment given to every party who entrusts you with an order. When a man begins to think of these things his business will surely move ahead.

You will excuse my saying so, but when you condemn a manufacturer of gas water heaters because he sells to a gas company, or to someone that is strictly not in the trade, for the reason that they sell a heater installed at what you might term a close price, you are making a very serious error. You overlook entirely the question of supply and demand.

Am I exceeding the bounds of truth when I say you would like to corral all that business at a greater completed cost to the customer for the same goods? The Gas Company are in the business to make and sell gas, and will go to any reasonable limit to see that every consumer requiring gas fuel gets it. That is their first and most important mission, and anything that will tend to increase the use of gas they are behind. Such a condition has a tendency to place orders in your hands for gas water heaters, to assist you in the development in the selling of gas fuel goods, and their relation to the sale of gas appliances, coming so near your business, is an invaluable feature. If it were possible for me to give a census of the users of gas water heaters to-day as against gas water heater users five or six years ago, it would be a great surprise to us all, and the demand has largely been created by the gas companies (in advertising, both by them and the various manufacturers) and to-day people do not feel satisfied unless they have a gas water heater in their home. The matter of final cost to the consumer will never be satisfactorily overcome by bad relations between you and any public utility corporation or dealer, but by a universal arrangement on the ways and means of handling this class of business. However, this is getting away from the question in hand. Suffice it to say that the

matter has been under discussion oftentimes, and I have shown the error of no profits in sales of gas water heaters in competition with Gas Companies and both good friends and good business have resulted after explanations in the sincere attention to this class of business.

Let us look at the matter from another angle and take up the manufacturers' side of the question. There are about thirty different makers of gas water heaters on this continent. Tests have shown that the various heaters have a great difference in efficiency, when you compare all makes with the standard of efficiency, and this difference is really a revelation, when heaters, that are supposed to be good heaters fall short of the standard, as proven by the sales of certain heaters that are known to be first water goods as against such low efficiency heaters. The subject of efficiency is one by itself, I will not dwell on the matter just now, principally for the reason that this difference shows up the heaters in all the various tests that must be made in order to call a heater "truly efficient," and therefore points regarding certain heaters that might not come up to standard, would be an unfair public comparison. However the fact remains that there is a great demand for gas water heaters, it is a live issue with almost every householder to-day, and must naturally command attention from all who are in the business. This demand means competition, competition means the gradual weeding out of those heaters that are not selling, and the increasing quality and service of the heaters that remain in the field. You can buy the very finest of these heaters at competitive prices. You can also buy some heaters that are not very good at these prices. How many of you can give a good practical demonstration of the difference in service value of the various makes of heaters sold to your customer? I hear you say that the manufacturer takes care of that point in his advertising! It is more a matter for you to thoroughly understand in order that you can cover the subject easily and with conviction to your prospective customer, than to have the customer depend upon third representations of this nature. First cost is by no means a final cost. You probably have noticed that regardless of the grade or quality of a gas water heater purchased for the first time by a customer, the second purchase is always of the very best heater made, oftentimes an automatic instantaneous or automatic storage heater. Is not this a significant fact? The manufacturer of an inferior heater would soon be obliged to discontinue the marketing of such heaters if the trade would prove by practical demonstration in the first sale

the superiority of the better class heater.

The importance of the way you handle a customer is proven by several experiences I have had in this respect. I have gone out to close up a sale of an automatic heater; asked if they had any regular sanitary engineer who did their work,—oftentimes the answer would be in the negative, but they would add that a few years ago so and so installed a small tank gas heater, that it had served its purpose satisfactorily but had played out and that doubtless that tradesmen would be a good man to instal the new heater as his work was satisfactory. A reputation that surely all of us are more than anxious to own, no matter in what walk of life we may be. We are living in an age that demands the utmost in results and to the man who can give this readily, easily, and with good grace will surely get the lion's share of business.

Manufacturers, plumbing supply houses, and dealers the country over are advertising gas water heaters right along, which all tends to increase the demand for such goods and your volume of business. The buying power of the public is something like a parable, you never know when you have got your customer. Only strict observance of a square deal, good workmanship and strict attention to the personal needs of each and every customer will establish a reputation and a business. It may start by the prospective buyer taking a fancy to you or your place of business, by the remarks passed by some third party, or by some trivial cause hard to explain. Then it is up to you to see that his requirements are looked after to the letter, and not have him or her feel that you are only half interested in his wants no matter how small.

To enlarge upon the ways and means of securing business would be a very difficult undertaking, but in a brief way will attempt to show some methods that I know are practical. Take off a list of your booked customers not having a gas water heater installed, or those that you know have heaters installed that are more or less played out. In addition take the directory and check up a list of those people on the streets in the neighborhood of your business. Rules of competition have shown you that your friends the competitors selling similar goods follow a plan, you go one better, say on the basis of a limited installation price for a certain period, making the price worth while. Remember you have got to start but after a little while to establish your ambitions it is not necessary to continue the plan. Go so far as to intimate to those already having heaters in that the price for re-installing a new heater will be so much. Mail a

nicely written letter on your letter head, using good paper and neatly signed and addressed, and you will be agreeably surprised with the results obtained. A much better way would be to take so much time each week and personally look these people up and give a price on the job. My experience is that if you can get a customer personally interested and to let you give him a price the order is practically closed. I do not mean a price sent him by mail, but write out a real nice business tender and take it to the party, and a little care in your manner of handling the man at this crucial moment will result in an order. When a customer starts to remonstrate that the price you have given him is greater than some other dealer, judiciously avoid any reference to this cost in so far as you can but dwell upon your being able to do the work right away. That it is a case of money back if not satisfied and that the additional dollar or so charges will be rendered in doing an extra first-class job which is quite necessary and probably has not been taken into consideration by your competitor, or in other words make the party feel that it will pay him to let you do this work, and establish your prestige with him then and there and follow it up by a good job. The next order from the same man will be easy, oftentimes voluntary, if the intimations here are followed out.

In conclusion I would repeat that it is your duty to select a reliable heater or heaters for your business, heaters that you know are real heaters, have means to show these heaters to advantage in your store or office, and strive to have some schemes different from the other fellow for your plan of selling, and I am sure that your results will justify all that I have claimed for the sale of gas water heaters.



ANALYSIS OF CAN. SANITARY ENGINEERING BY-LAWS.

(Continued from page 13.)

for its being inserted in a main house drain. The City of Toronto demands it, in spite of the fact that nine-tenths of the sanitary engineers in Toronto would not install it if left to themselves.

Sanitary engineers are blamed for trying to make plumbing installations as expensive as possible, when in reality they are not as a whole guilty. If every town and city in Canada were compelled to place a sanitary engineer upon each board of health, the public would very soon see and realize the value of such an official. There would be more practical plumbing inspectors, fewer antiquated by-laws, and no incompetent men practising at the trade. The latter class are

the worst menace of all. Because so many men are given the position of plumbing inspectors the botching plumber is able to exist, at the expense of the public, who form the opinion that all plumbers are alike, when such is very far from correct.

Clause 27.—Every vertical soil pipe must be extended at least two feet above the roof of the building and above any window within a distance of thirty feet. The end of the pipe shall be left open or with a wire basket end, without a return bend, hood or curve.

This clause is one which would have been very much better had the by-laws been drafted by a thoroughly practical man. They seem to have been copied to some extent from by-laws of an older city—for instance, the portion demanding that the pipe shall extend two feet above any window within a distance of 30 feet.

Fig. 1 embodies a suggestion which is a great improvement compared with the extension of a long shaft of pipe, in many cases 15 feet high. These long lengths are often closed up with hoar frost during the coldest portion of the winter.

Clause 28.—No soil pipe or waste pipe shall have at any part a less fall than one-fourth inch to the foot. The fall must be towards the outlet.

Clause 29.—Each building or dwelling must have its own separate soil pipe or drain and sewer connection, and the plumber shall be responsible for the proper connection of his work with the system of sewers.

Clause 30.—The arrangement of soil and waste pipes shall be as direct as possible.

Clause 31.—All vent pipes from fixtures shall be carried up through the roof, the same as soil pipe, the diameter to be not less than three inches where it passes through the roof. These vent pipes from the different fixtures may be branched together and pass upward to roof, or may be connected with the main soil pipe above the highest fixture.

Clauses 28, 29 and 30 are of a very general nature, and need little or no comment. Clause 31 could be improved by giving the number of vents and sizes which would be allowed to be branched into a 4-inch main vent. It must always be understood that any vertical stack which extends up through the roof of a building becomes a vent after the last fixture has been connected with it. In Canada all vents should be increased to 4 inches at the roof, even though there only be one 1½-inch vent taken off it.

Sanitation, as Practised by the Kaiser

Showing That While the Kaiser Demands the Very Latest Sanitary Conveniences When on a Visit, Yet He Fails to Supply Such Necessities for His Own Household.

Abstracts reprinted from the Secret History of the Court of Berlin by Countess Ursula Von Eppinghoven.

NO member of the human race has acquired such notoriety since Napoleon as has the Kaiser. He will go down to history as the most eccentric of any ruler since Nero, in fact a very conglomeration of contradictions. Sanitary engineers have learned so much from the German race about sanitation that we shall be surprised to hear that in the royal residence of the Kaiser, no such commodity as running water exists. We have, however, every proof before us that such was the case a few years ago. To be told that William Second did not possess such a thing as a cast iron enamelled bath, is almost unbelievable. However, we will give our readers a few statements from the pen of Ursula, Countess Von Eppinghoven, Lady-in-Waiting on her Imperial Majesty, the Kaiserin, from an interesting book dealing with the secrets of the Kaiser's court. Speaking of the bed-chamber, and rooms adjoining, we are told that:

"In a small alcove opposite the windows stands a single brass bedstead, with spring and horse-hair mattresses, whose English arrangement of sheets, blankets, and chamois cushions gives the servants perpetual cause for grumblings. To the left of the alcove is the door leading into their Majesties joint bedroom, while on the other side a large closet, built in the wall, contains the Kaiser's body linen, not much of it. All the historical half dozen shirts a Prussian monarch or prince is entitled to are here, but, 'horribile dictu,' the article is innocent of cuffs, a commodity William attaches with the aid of buttons and pulleys, like any poor lieutenant. Of socks, never above a dozen pairs are in use, half yellow, half brown, and, like the underwear, of lisle thread; but the Hohenzollern house laws eventually impose no restriction as to handkerchiefs, which seem to come by the gross, all like the shirts, drawers and socks, inscribed with 'W' and the royal crown.

"While the modern articles of furniture heretofore mentioned are of the most ordinary description—store goods, and not the most expensive, either—his Majesty's washstand is of truly royal dimensions and elaborateness, occupying the best part of the rear wall at the side of the mantel. It is made of light wood with an imposing top and shelves, decorated with handsome crystals and silver

boxes, carafes, brushes, and jugs. Was ever King of Prussia, or a Holy Roman Emperor of German nationality, so well fixed in respect to toilet requisites? And would William be that wonder of neatness to all the people in his employ if it were not for his English mother? Such questions are constantly agitated in the palace among the servants as well as officials, for the laundresses, and especially the maids who attend to the royal chamber, carrying up three flights of stairs, the oceans of hot and cold water his Majesty requires continuously, during the day till late at night, regard William's passion for cleanliness as little short of crime, and the court-marshal has his hands full pacifying the overworked and discharging the sulky, particularly those dragging the Empress Frederick's name into the discussion.

"'I should think myself in heaven,' said my mistress some time ago after reading a magazine article to the effect that even the bedrooms of a moderately-priced American apartment house are provided with running water, hot and cold—'I should think myself in heaven if such were arranged for my husband's and my use, not to mention the children's, and I am the Kaiserin'—A kaiserin, she might have added, whose revenues are sequestered to ostentation."

Of course, we must not allow our readers to suppose that cleanliness is merely a show, such is not the case by any means. We are told that there are sponges and skin-brushes galore upon the marble shelves of the wonderful marble-shelved wash-stand.

There are no such luxuries as toilet waters, or Eau de Cologne. Although the Kaiser will not hear of such necessities, he has one particular brand of soap, which serves the purpose for both bathing and shaving. And, as Countess Von Eppinghoven says "with the persistency that is William's chief characteristic, he not only uses this particular brand of soap himself, but also insists on its presence on the toilet stand of every member of his household."

We have often been told and have also read from time to time, that woman in Germany is looked upon as some inferior human animal, but to be told that the Kaiserin likens the accommodation of an ordinary apartment house to

heaven, is apt, to make us liken the homes of the ordinary Germany housewife to Hades, to say nothing of the royal home of the Kaiserin of Germany. The man earning \$5 a day would be looked upon as having "some nerve" to ask his wife to live in a home in Canada which did not have hot and cold water at the tap. Whose wife would change places with the Kaiserin?

As stated above the Kaiser could not lay claim to be possessor of an ordinary cast iron enamelled bath. The Countess says:—

"To the luxurious washstand his Majesty's bath furnishes a formidable contrast, being an ordinary zinc tub, painted. But the most astonishing thing about it is its peculiar situation. Let those who consider themselves Fortune's graceless children because their neighbor's house or carriage or wife or diamonds are their neighbor's, take courage in the thought that Germany's Kaiser, twice a king, as many times a grand duke, eighteen times a duke, three times a margrave, once a burgrave—whatever that means nowadays.—twice a prince, nine times a count, and fifteen times a seigneur, besides being a bishop, bathes behind a curtain in a stuffy corridor, the connecting link between his dressing room and the conjugal bed chamber. That this statement almost challenges belief, I am not the least to appreciate, but can reiterate its truth. And, when you come to think it over, it is more startling than the story relating to King Leopold's bath in the Potsdam Stadt Schloss.

"Count Marshall Liebenau was all in a flutter when, in August, 1890, his Belgian Majesty came to return the Kaiser's visit to Ostend, for his colleague of Brussels had informed him that the Sovereign gentleman was addicted to the daily bathing habit, and demanded a hot bath at that. There was, at that time only one royal palace available in town (the Kaiserin objected to entertaining Leopold at her own house) and this, the Stadt Schloss, contained but a single bath-room, which, to further complicate matters, is attached to the bridal suite where Prussian Princesses pass their first night of matrimonial bliss. To lodge the debauchee in that sacred apart-

ment, which only once before had been defiled by a man who was not a bridegroom at the time of occupancy by Napoleon I., was out of the question, and if a cabinet was fitted up with the regulation German bath tub and stove, the King would certainly poke fun at the antediluvian arrangement.

"What, then, could be done?"

"At last Liebenau hit upon a plan. He set up a modern enough bath that was fed by a cold water tap, and placed under one end of it a row of gas jets intended to heat the water in the bath tub, should his Majesty find the bath too warm, calculated the official, with true native acumen, he can moderate the heat by turning on the cold reservoir.

"Now, Leopold had enjoyed the previous night's festivities very much, and observing, in the morning, that his slightest wishes in regard to bodily comfort had been anticipated, he rose in right good humor. Stepping buoyantly into his bath, at the cool end, and turning round, he sat himself down at the other, which, the gas having just been turned off, was nothing short of a furnace with the red hot coals removed.

"At the same moment an unearthly yell rent the castle from Marble Hall to scullery; the sentinels, marching up and down before the great gate, called out the guards, and dozens of officials and servants ran to the King's suite of apartments thinking that his Majesty had been attacked. At last, the chies not ceasing, Herr Von Liebenau, together with the housekeeper and the King's adjutant took courage and burst into the bath-room, where they found his Majesty dancing an impromptu Highland fling, and war-whooping alternately in French and German for liniment and cold cream. What he said to the court marshall became known only after the latter's dismissal and disgrace, for the servants who heard his Belgian Majesty read the index of Brehm's "Annual World," never dared repeat the all-highest's observations during Liebenau's official life.

"As a further consequence of the incident, it might be recorded that King Leopold did not ride to the parade held in his honor that morning but viewed the ceremonies from his window."

Some time ago, one of our medical brethren stated that he would condemn every house as being unfit for human habitation if it was not fitted up with hot and cold water at the taps and a good serviceable bath, and here we find at as late a date as 1904 a royal palace without even a modern bathroom, occu-

pied by the would-be mightiest monarch on this earth.

The idea is almost absurd. We may be easily excused if we conclude that it is almost impossible for any person to be perfectly sane when living in such insanitary environments. Of course, it may be that while the Kaiser would never flinch at spending a few extra thousand marks for a splendid dinner, he may pale when confronted with the ordinary "plumber's bill," but such a scare is only imaginary. The housewife very seldom criticizes the price of a bun, or a loaf of bread, because she has an idea what energy it costs to make such a commodity.

In spite of the fact that such conditions prevail as not having an ordinary up-to-date bathroom and other sanitary appliances, in the Kaiser's royal palace, he must be credited with going to quite a little trouble when taking a bath. If business or pleasure prevents him from indulging in his morning dip, he will not rest until his full daily quota of bathings have been gone through, and stoves must be kept burning all day long to ensure there being a large quantity of hot water on hand, and we are told that a tablet of soap is consumed on every occasion.

After stepping out of the famed zinc-lined, painted tub, the Kaiser applies to his body several gallons of cold water in which sea-salt has been dissolved, baling it over his body rather laboriously, from a vessel near at hand. Even though there is no running water in the palace, and the royal household are expected to put up with all kinds of inconveniences as a result it is quite another thing when his Majesty goes on a shooting expedition. He very seldom stays longer than two days, the cost of his entertainment being between ten and twelve thousand marks, and, to quote the Countess Von Eppinghoven:

"The country residences of our Prussian grandees, you must know are, as a general thing, quite innocent of sanitary arrangements, and often several rooms must be entirely rebuilt and furnished with running water before his Majesty will set foot in the house."

We could quite understand his Majesty taking such a stand, if such sentiments were practised in his own royal palace. And it is not a case of being invited to a shooting party, for the Kaiser is by no means slow to invite himself if he finds that there is likely to be abundance of sport.

"Mark Twain has written many funny things about the German and his tub, or the absence of the latter, said Court Marshal Eulenburg when speaking to me after meeting the American humorist in 1891; but he could surpass himself if I were to give

him only part of the correspondence I have had with our nobility on the subject of providing adequate bathing requisites for his Majesty."

"One gentleman, in the Province of Prussia, tried to evade the obnoxious obligation of having to supply a bathroom equipment, by impudently suggesting that he dared not offer his Majesty a bath after one night's journey, as it involved the insinuation of excessive dirtiness on his guest's part."

It may not be out of place while telling this story to refer to the question of household linen. We are told that it is often a difficult matter to procure an extra change of bed linen for their Majesties, the cry is "not sufficient funds." This, in spite of the fact that the Kaiser reserves something like fifteen and a half million marks for their Majesties' own personal use which sum is spent in frills and puffery, and not by any means in actual necessities.

The statement that the royal servants, men and women, are kept exceedingly short in respect to towels and bed clothes, will surprise no one. As a matter of fact, the allowance for the first-named articles is two per week; the bed linen is changed once a month. And yet every person of the royal household is supposed to be a paragon of cleanliness. We will here relate a conversation in part between the Kaiserin and Countess Von Eppinghoven:

"One evening when we were talking in her Majesty's dressing-room of the vagaries of Prince Frederick Leopold, the Countess Bassewitz remarked that his Royal Highness compelled his valets and the chasseur, who served him at table, to bathe two or three times a day, morning, noon, and night; that is, before they came into personal contact with him. 'That is extravagant,' said her Majesty, 'but persons of our rank cannot insist too strongly upon the daily bath for their attendant.' 'If there are enough bath-rooms!' I could not resist the temptation to throw out this hint. 'Well,' said the Kaiserin, I suppose there is a sufficient number in our palaces, at least here and in the Schlos.' 'I beg your Majesty's pardon,' I spoke up; here, as well as in Berlin, we have but two bath rooms for servants—one for the men, one for the women."

"The Empress gave me a startled look. 'Two bath-rooms?' she gasped. 'T-W-O,' I repeated; 'and not only the people of the body-service, but all the liveried and uniform men and women in the palace—coachmen, fourriers, chasseurs, and heads of the household department—are expected to use them.'

"'Meine Liebe,' said the Empress, in her haughtiest tone, 'you are evidently misinformed,' and, rising from the arm-chair, she shook off her dressing sacque with a little shudder, as if to repel an unclean sensation."

"'I do so hate to speak of matters of that kind,' she added, dismissing us with a curt bow."

"What would her Majesty have thought if I had continued in my revelations, gathered at random during my long connection with the household, for the scarcity of bathrooms is not the most disgraceful evidence of penury at the Prussian Court, by far."

"The two eighteen by thirty-six-inch huckaback towels given out every Saturday must suffice for the casual bath as well as for the every day ablution. The servants' wash bowls are little tin affairs, holding about three pints; foot-tubs and pitchers are tabooed, together with other conveniences. But that is not all."

"The toilets for the servants are located on the back-stair landings, which are lighted by kerosense lamps, day and night, and one closet must do for every twenty-six persons. If the palace is ever visited by an epidemic, the air will be laden with 'I told-you-so's' in high and low quarters."

It can be plainly seen by our readers that the Kaiser is anything but consistent, his own home and surroundings being the reverse of sanitary, not even a sufficient supply of linen, being provided. We are told that the German people have to provide no less than one hundred and sixty million marks for the civil

list, a sum much larger than the French people charged Marie Antoinette and her husband with spending.

"See the ogre that devoured twenty-five millions!" were the damnatory words hurled at the two latter persons mentioned, as their royal chariot rolled into Paris on Oct. 6, 1789.

If Kaiser William and his consort only willed that the very latest sanitary appliances be installed, their wishes would be gratified at once. But it seems their Majesties prefer to be blind to the actual condition of things and to spend millions of marks upon the pageant of superficial splendor which is necessary to most royal courts. It is such conduct which turns a thrifty well-meaning people into a seething mass of anarchism.

As at present, there seems to have been somewhat of a chronic state of unrest in times past at the court, to again quote:—

"At the time when the whole of Germany was in a state of unrest and

misgivings as to who would accept the Chancellorship, after Caprivi's dismissal, Oct. 1894, the Kaiser came down to second breakfast, and all of a sudden, he exclaimed, 'There's a pretty state of things,' everyone present expected to hear that Uncle Chlodwig had finally refused the office."

"'Here's a pretty kettle of fish!

"'This city of —, (naming a small Rhenish town), 'petitioning to build sewers and proposing to empty, according to plans submitted, the refuse into the river just above the chief bathing establishment."

"'Of course, nobody in the home office saw the terrible mistake, and it took me four hours to correct the drawings and suggest a better plan."

"'Bothering about the sewage of a secondary town while the German Empire is quaking in the throes of a crisis, is a phenomenon of rapid thought, or else an anomaly, born of the passion to play Providence."

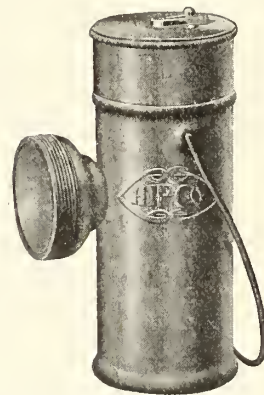
New Sanitary and Heating Goods

PORTABLE ELECTRIC LANTERNS.

The Hipwell Mfg. Co., of Pittsburgh, Pa., manufacturers of flashlights and incandescent goods, have recently placed on the market two new types of portable electric hand lanterns. This firm claims that up to date there has really never been any good substitute for the oil lantern, as the various types of electric lantern which were constructed were more with a view to serving as a novelty than a really useful proposition. Hipco lanterns use the ordinary No. 6 dry cell, which is said to be obtainable at practically every hardware store, and are substantially constructed of very heavy

seamless drawn tubing or stout quartered oak.

No. 50 Hipco lantern, which uses the seamless drawn brass tubing case, comes in a choice of three finishes—brass,



No. 50 Hipco Lantern.

nickle and black and all nickle, and lists at from \$2.25 to \$2.50 complete with batteries, according to the finish; while the oak lantern, No. 40 and 45, list at from \$2.25 to \$2.50, depending on whether one or two cells are used.

Hipco lanterns are equipped with the new type of G. E. Mazda tungsten bulb exclusively, and the makers claim a remarkable service is obtainable, varying from 40 to 90 hours, depending on whether one or two cells are employed.

The makers of the lanterns state that the Hipco electric lantern will stand hard, constant service. They also point out that there is absolutely no danger from fire when electric lantern is used.

MARK TWAIN'S ADVERTISING STORY

Once upon a time Mark Twain was editor of a paper in Virginia City, and a subscriber who found a spider in his copy of the paper wrote asking whether this was good or bad luck.

Twain answered through his paper as follows:

"Old Subscriber:—The finding of a spider in your copy of the Enterprise was neither good luck nor bad. The spider was merely looking over our pages to find out what merchant was not advertising, so that it could spin its web across his door and lead a free and undisturbed existence ever after."

No spider ever spins his web across the door of a busy advertiser.



Hipco Electric Lantern made for one or two cell batteries.

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TORONTO, DECEMBER 15, 1914

Christmas Greetings

ANOTHER year has been unfolded to humanity. Nature has done her part faithfully. The sun has risen and set 365 times, shining on the just and the unjust. But what have we done? What has the human race accomplished? What have sanitary and heating engineers done? Have we, as such, done our part as faithfully as we know how? If not, we are the sufferers. Has progress been retarded by our inactivity in any way? If so the world suffers along with us. This is the close of another year. We should look into the inner pages which Father Time turns over every day and see what we have done or left undone. No calling is so worthy as that of the sanitary and heating engineer. On no other class of tradesman does such responsibility for man's bodily comforts or discomforts rest as on our craft. Our services begin to play a part at man's birth and are necessary all through his life. If we have not done our duty faithfully, how can we wish our patrons a Merry Christmas? Merry Christmas! What do those two words mean? Do they mean anything at all?

"Why should I wish you 'Merry Christmas?' My wish can bring no joy—or yours.

Joy ever comes unsought

As fragrance comes to him who gathers flowers upon the path he treads.

Go, gather flowers of kindness!

Be Christly.

Enact the brother's part.

Give as the Christ has given,

Asking no favor in return.

Make merry some sad heart,

And then, unwished.

Enjoy a Merry Christmas!"—C.W.C.

Sale of Gas Water Heaters

IN these days of business depression, there are several things which can be done to either stimulate or create a demand for goods, or make preparations to cope with the great volume of business which we know will be opening up at the close of this fearful war we are now waging. If there is one thing more than another that sanitary and heating engineers have paid least attention to, it is the sale of gas water heaters, and like the demand for more than a score of other lines of merchandise, it has been catered to by gas companies and hardware merchants.

Not many years ago the writer was in conversation with a superintendent of a gas company upon this very subject, and he stated that their company would never have thought of taking up the sale of gas stoves, water heaters and the like if the plumbers had got after the business. This company made a canvass to see how many houses had gas water heaters in use and found so few, only about 10 per cent., that they were astonished. To-day that particular city is twice the size and over 75 per cent. of the houses have a gas heater in use. In spite of the fact that almost every gas company handled gas water heaters, there is lots of business to be had for every member of the trade if he will only get after it. The article which appears on another page gives some very interesting figures which are based upon the actual experience of the writer of the article.

The Kaiser and Sanitation

THERE appears on another page an article which for most part is reprinted from a very interesting book entitled "The Secret History of the Court of Berlin," and we have every reason to credit the statements made by the author who was one of the ladies-in-waiting of the Kaiserin. The Kaiser, by his present behavior, has made it possible for anyone to believe all we read in this interesting book. It may be said that besides the strange conditions relating to the court's sanitary appliances there is quite a lot of other very interesting reading. The latter part of the article where reference is made to the Kaiser having to re-plan a sewage system, does not say much for the German Government. Sanitary engineers have, to some extent, been led to believe that the German people were away ahead of us in this country in the science of sanitary engineering. If such is the case, it is rather strange that better sanitation is not practised in their Monarch's residence.

A Chat With Our Subscribers

WE are nearing the close of another year, a year which will stand out in history as being the most notable of any since the world began, the death knell to wars and warring peoples has rung out. At the close of this war things will settle down to peace, and peaceful life, industrial thought will be more dominant. More study will be given such work

as will create efficiency, etc. After the cost of this great war has been settled, there will be more money to spend upon works of a productive and economic nature, and it will mean that if we earn more, we must learn more.

The Sanitary Engineer is in existence for a purpose, and that is to be of service to its readers. The articles are written with a view of service, and to increase that service it needs the co-operation of its readers. We wish to thank our readers for the way they have co-operated with us in the past, and hope to have more such assistance during the year 1915. Any suggestions from our readers with a view to increasing the usefulness of the Sanitary Engineer will be only too gladly considered. Any expression of our reader's views will always find a ready ear, because it is only by such exchange of ideas that we can hope to keep pace with *Dame Progress*. A word in conclusion. We have on file quite a number of questions which cannot very well be answered through the columns of the Sanitary Engineer, which bear no address and in many cases no name. In the case of no address being given, it has been necessary for us to search for the addresses. We are pleased to receive all the questions possible, but must insist that both name and address be given, not necessarily for publication, but merely as a guarantee of good faith.

No More Free Estimates

THE sanitary and heating business is run upside down, those who know the least about it will advertise estimates free, and will in 99 cases out of 100, take the job at any old price. The lawyer, the doctor, and the architect charges for his advice, and rightly so. If a person is caught begging on the street, he is imprisoned, and for each offence the sentence is more severe. This vagrant is a criminal, and is looked upon as a menace to the public welfare. He is only asking for something for nothing and it is the privilege of every person to refuse the beggar, but if every beggar ever born were let loose, and never molested, and each one got what they asked for every time, they would not be receiving as much value from the public, as the public are asking free, from the sanitary and heating engineer. Every person who asks for a tender is worse by far and is a greater menace than the beggars who go from door to door. The law should not allow it. It is the biggest curse there is in the trade.

The more a sanitary and heating engineer knows about his business, the fewer tenders he will submit, unless he is reasonably sure of getting the contract. There are several reasons for this asking for tenders, but none justify their being submitted free, any more than that goods be given away free. If the time spent in submitting tenders were to be devoted to study, or business details, that time would bring returns, and we fail to see why the beggar in the street should be imprisoned for asking a few cents, or a piece of bread, and the public at large permitted to beg thousands of dollars worth of valuable experience, which is the very best asset of the trade. The thing seems ridiculous. If a person wants to know what a certain system of sanitary, heating and ventilating is going to cost, he should be prepared to pay for that information. If the beggar on the street were not given sufficient encouragement to continue the game, he would soon try some other scheme, the same with the public who ask for the estimates free.

Electricity and the Farm

THE use of mechanical power as a substitute for horse-power on the farm is not by any means a new idea among Canadian farmers. Farmers have been using water and steam power for many years. Gasoline engines and gas power equipment of various kinds may be found in use on many Canadian farms. The farmer of to-day is looking for modern and convenient equipment which will assist in making farm life more picturesque and less irksome. A new era in the use of mechanical power for the farm is rapidly developing. Electric energy which is said to be much cheaper than steam power and more easily controlled is finding its way to many Canadian farms, particularly in Ontario, where the development of Hydro-Electric power is working wonders. The farmer a few years hence will be a large buyer of electric appliances of all kinds. Just as a tremendous demand for electrical appliances has developed at a surprisingly rapid rate so it will develop in the rural districts within the next few years. When the farmer's home is connected up with electric pumping machinery and pneumatic water supply just the same as his city cousin. He will want electric pumping machinery and pneumatic water supply systems. Therefore it goes to show sanitary and heating engineers what a field there is for them to open up, by the installation of up-to-date sanitary equipment.

Editorial Suggestions for 1915

WE, the undersigned, do hereby agree that we will devote more time to the following:
Our overhead expenses and find out what they are and all about them.

* * *

Not forgetting that the employer's salary should always be included, providing he is actively engaged in the business.

* * *

That we will refrain as far as lies in our power from patronizing the "price-cutter" and that we will not cut down our prices to meet the "other fellow's."

* * *

That we will endeavor to see that every man who is out to give everybody a square deal gets a fair price, or he fails to give himself a square deal.

* * *

That we will bear in mind that, in actual fact, we are members of one body, and if any one member of that body suffers because of price-cutting, the whole body suffers likewise.

* * *

We will also refrain from making ourselves believe that we can once in a while put *one* over the other fellow, because from past experience we find it is generally *two* on us.

Signed by

*Every Sanitary and Heating Engineer
in Canada.*

The Principle of Elbow Pattern Developing

A Complete Course, Treating in a Simple Way, the Art of Elbow Pattern Developing. Specially Written for Those Who Have Only Received a Limited Geometrical Education.

By EDWIN NEWSOME

THERE is another matter to consider in elbow design and that is the length of the small or large end. It may be that the material will allow these end pieces to be a little longer than the measurements which are to be had within the ordinary lines of the 90-degree radius, see the small dotted lines at E. F. in Fig. 1, plate 2. This of course will seem to have nothing to do with the radius of an elbow.

Before commencing to lay off the pattern of any kind of elbow, it is necessary to first determine the radius, the diameter, the number of pieces the elbow is to be made up with and the length of pieces at each end. Suppose it is desired to construct a 12-inch elbow with an 18-inch radius, draw two lines as shown in Fig. 1, G. B. D. and open up compasses 18 inches. Drawing an arc from D to B this will be the outer lines of the elbow, then leaving the compass point at the same position, close up to 6 inches and make an arc as shown at C. A. This will give the length of the throat, as well as the size of elbow. Fig. 1 shows the elevation of a three-piece elbow. To determine the various degrees of each piece, the arc D. B. must be divided in a certain number of equal parts. We will proceed to develop the elevation of the four-piece elbow, but in doing so will also refer to Fig. 4. It is necessary to bear in mind the following rule: For a two-piece elbow 2 pieces each 45 degrees. A three-piece elbow 2 pieces $22\frac{1}{2}$ degrees and 1 piece 45 degrees, see Fig. 4,

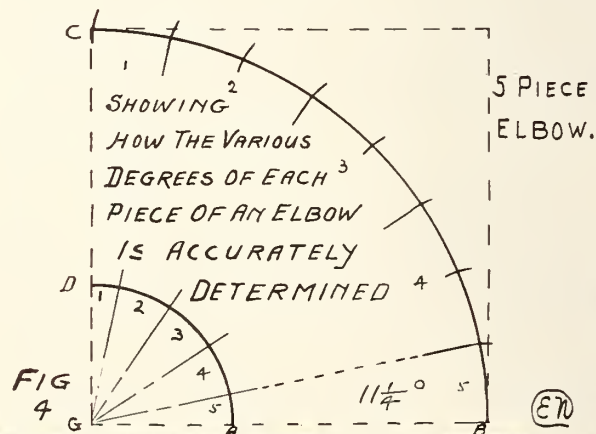
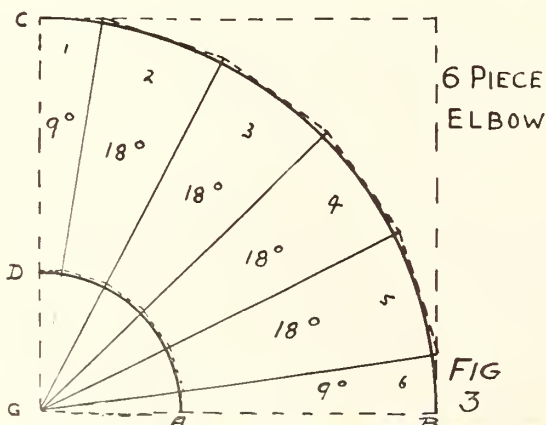
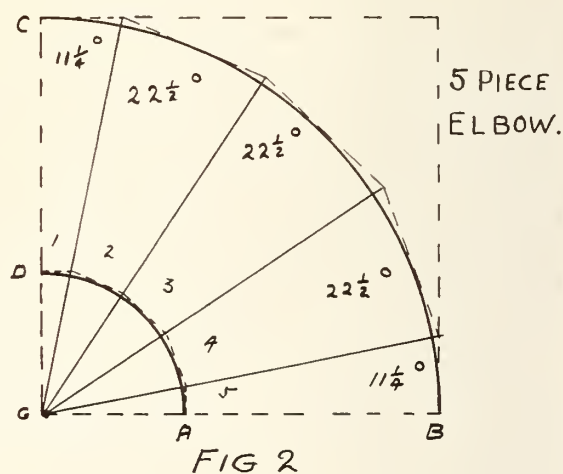
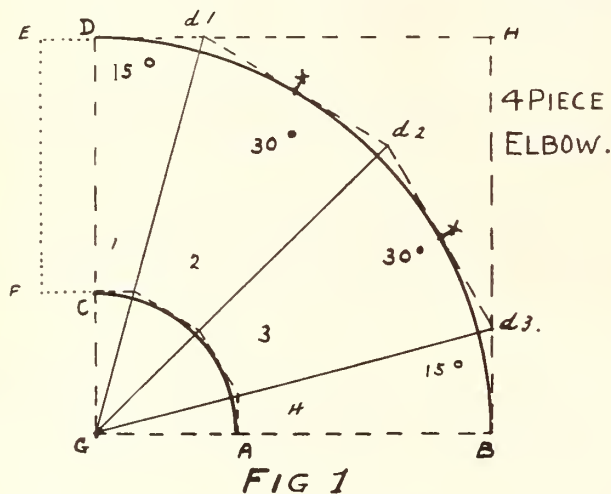
in plate 1. A four-piece elbow requires 2 pieces 15 degrees and 2 pieces 30 degrees, see Fig. 1, plate 2. A five-piece elbow requires 2 pieces $11\frac{1}{4}$ degrees and 3 pieces $22\frac{1}{2}$ degrees, see Fig. 2, plate 2. A six-piece elbow requires 2 pieces 9 degrees and 4 pieces 18 degrees each. See Fig. 3, Plate 2.

It will be seen that if a four-piece elbow is needed it will be necessary to divide the arc D. B., Fig. 1, into equal parts, therefore to obtain 2 pieces of 15 degrees and 2 of 30 degrees, 6 equal parts of 15 degrees each. See d 1 and x d 2 and x and d 3. B to d 3 counts one piece of 15 degrees, d 3 to d 2 counts one piece 30 degrees, d 2 to d 1 counts one piece 30 degrees, and d 1 to D counts one piece 15 degrees, the whole four pieces making up the required 90 degrees. To draw the elevation of a 5-piece elbow the arc C. B., Fig. 2 will need to be divided into 8 equal parts. For a 6-piece elbow, Fig. 3, the arc C. B. will require to be divided into 10 equal parts.

Let us explain this subject in another way. If a 3-piece elbow is needed, the arc must be divided by 4 and to know what degree is required, divide 90×4 , if a 4-piece elbow, divide 90×6 . For a 5-piece elbow divide 90×8 and for a 6-piece elbow divide 90×10 . Fig. 4 is simply an example, by multiplying $11\frac{1}{4}$ degrees by the number of spaces (8) the full 90 degrees are given.

Continued in next issue.

PLATE 2.



EN

What Are We, Plumbers or Sanitary Engineers?

Making it Plain That the Sanitary Engineer is the Man Who Has Responded to the Note of Progression, That the Plumber is a Craftsman of the Past.

By Professor Arthur Bateman,
Director, Anglo-American Sanitary Correspondence College, Chicago.

IT may be questioned whether the time has not arrived when steps should be taken to arrange a little more uniformity in the practice of the plumbing trade and sanitary engineering profession with regard to titles.

Mr. A. adopts the title "Plumber," Mr. B styles himself "Sanitary Engineer," Mr. C is a "Sanitary Specialist," Mr. D a "Domestic Engineer," Mr. E, a "Sanitarian," Mr. F. a "Sanitarist," while creative Mr. G. invents and adopts the title "Sanitist."

Present day legislation permits a person to adopt any of these titles to the detriment of those possessing adequate knowledge of our work and who may be correctly termed public benefactors.

It is agreed that our work is an absolute necessity to the community and just as important as the medical or other profession. Why, then, should any man capable of screwing a pipe be permitted to paint the title "Sanitary Engineer" in glowing colors on his store sign without any qualifications whatsoever.

What constitutes a plumber and a sanitary engineer?

If we give this matter our attention we will find in the perusal of ancient history pertaining to our craft that the plumber derived his name from the Latin word *plumbum*, meaning lead, hence the title plumber, a worker of lead. However, this title was only adopted by those actually engaged in the manipulation of lead in its metallic state and not by those who mined the galena and converted it into sheets, pipes, etc.

Time has divorced the original meaning of the word "plumber" and the present time definition depends to a very large extent upon the country and locality in which he receives his training, also upon the kind of work he is engaged in.

The old time plumber was an artist in lead and solder, and carried out his work in plain sheet lead, castings and ornamental features in the most artistic and substantial manner; but now there is comparatively little lead pipe used, while sheet and ornamental lead work on roofs is a rarity outside of Europe.

Further, modern methods of manufacturing plumber's material are more economical than the ancient methods and there is such a small demand for cast and other lead work that the ancient plumb-

er and his work may be considered obsolete in this progressive age.

A more appropriate definition of our modern plumber and one which apparently covers the scope of his work satisfactorily, is as follows:—

"A plumber is one engaged in the business of plumbing, and plumbing is the science, art, or occupation of installing into buildings, sanitary fixtures, pipes, traps, etc., for the conveyance of water and sewerage."

Consider now the sanitary engineer.



PROFESSOR ARTHUR BATEMAN.

In order to arrive at a good definition the words should be considered separately. "Sanitary" refers to anything which pertains to or is designed to secure health; while "engineer" may be defined as a person skilled in the art of directing the great sources of power in nature for the use and convenience of man.

Let us incorporate the foregoing conclusions and define a "sanitary engineer" as a person who has by diligent study and practical experience acquired an adequate knowledge of the phenomena, laws and principles of sanitary science and engineering, and is skilled in the art of designing and executing complex sanitary works and processes, and capable of improving materially the

accepted sanitary methods and procedures.

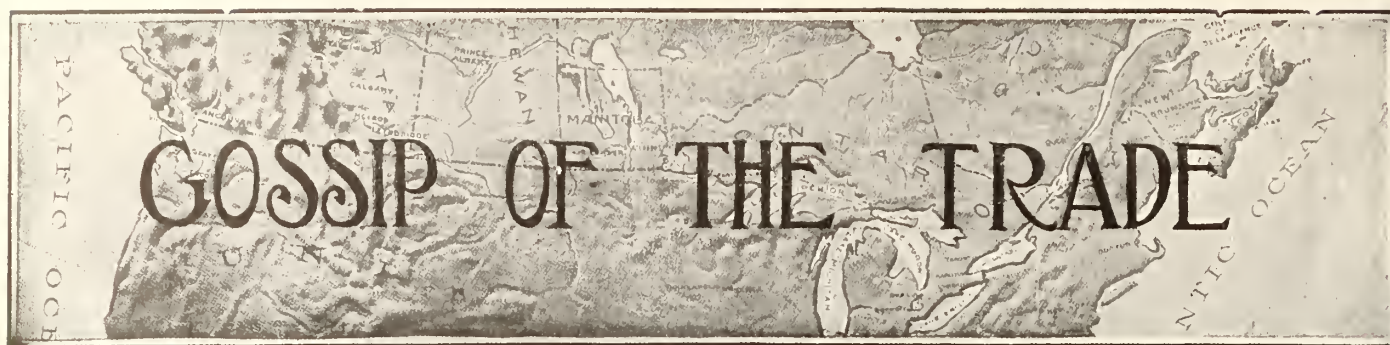
To be more explicit, an efficient "sanitary engineer" is capable of devising sanitary works, drawing plans, sections and details, making sanitary surveys, writing specifications, preparing estimates, writing reports, and drawing up new and remodelling obsolete sanitary codes, besides possessing an all-round knowledge of the following allied subjects:—Elementary chemistry of building materials, elementary physics and meteorology, the principles of hydraulics; water supply, including sources, storage, purification and distribution; drainage and sewerage, including sanitary fixtures; sewage and garbage disposal; disinfection and disinfectants; building construction, specifications, quantities and estimates; lighting, heating and ventilation; setting out and supervising works, including surveying and levelling, inspection and testing of materials, report writing and sanitary legislation.

Surely there is a vast difference between the title "plumber" and "sanitary engineer," but under the present lax system of legislature any quack can adopt a professional role, and the writer firmly believes that the existing host of efficient sanitary engineers, or those possessing the necessary ability to secure the title, would hail with delight the most stringent laws compelling every person to prove by actual deeds and examinations his capability of carrying out work which may be so beneficial or detrimental to the community in general.

Granted, that this is the age of specialism and that plumber's work is becoming closely allied to sanitary engineering, the question arises, what are interested bodies doing on behalf of the younger generation? At the close of their apprenticeship will they be sufficiently proficient to pass such examinations as will designate them professional engineers, or will they be plumbers, or, shame to say, only pipe fitters?

The rising generation must be given to understand that sanitary engineering is a profession, and that as with all other professions, much midnight oil must be burned to master its technicalities, otherwise they have no right to, and will

(Continued on page 24.)



British Columbia Sanitary Inspection.

That Canada's Western Province is keeping to the fore in the matter of sanitary measures is evidenced by the fact that the Provincial Health Department has despatched inspectors to the new settlements, mining, logging and construction camps, where there is a lack of sanitary conveniences. Too often very little care is given to cleanliness and health precaution in these temporary establishments, and it is with a view to a thorough investigation of their condition that the present inspection is being made. Reports so far received show very satisfactory results of the Government's watchfulness.

1 Air Supply for Sleeping Rooms.

Room overcrowding is a very different thing from land overcrowding; but here, too, there are difficulties in the way of establishing arbitrary standards. What constitutes room overcrowding? The only standard that has been adopted heretofore on this continent has been the standard of a minimum amount of cubic air space. In most cities this standard has been 400 cubic feet of air for each adult, and 200 cubic feet of air for each child under twelve years of age occupying a room. Such a standard is valueless. To illustrate: A bed-room seven feet wide, ten feet long and nine feet high contains 630 cubic feet of air. Let us assume that it is well lighted and ventilated, by a large window opening directly on a broad street, and that the room communicates with other rooms with sufficient windows and thorough ventilation. No better bed-room could be devised from the point of view of health and sanitation, and yet, under such a requirement of law a man and his wife, or two boys fourteen years of age, could not legally sleep in this room, because there would not be 400 cubic feet of air for each occupant.

If 400 cubic feet of air is not the proper minimum, what is the proper minimum? Shall it be 600 or 800 or 200 cubic feet? Study of the problems involved leads to the conclusion that not only the question of cubic air space must be considered, but that far more im-

portance must be attached to the kind of air supplied to the room and the frequency of its renewal. It would be much better to permit a family to sleep in a room containing but 400 cubic feet of air of excellent quality and frequently renewed, than to permit them to sleep in a room, containing four times the air space, where the renewal was not so frequent nor the source of original supply so satisfactory. It makes a very great difference whether the air comes from a broad street or from a narrow alley, from a large backyard or from a narrow airshaft. These considerations are generally lost sight of in the discussion of this problem. This question, like that of land overcrowding, cannot be solved by establishing any arbitrary standard.

Water Waste in Winter.

Several cities in Canada are to-day in a serious position because the water consumption is equal to the supply. The result is insufficient pressure in the water mains for fire purposes. With the coming of winter weather this situation will no doubt be accentuated, due to leaving taps open, thus allowing the water to run therefrom for many hours at a time, to prevent the pipes freezing up.

Not the least of the many advantages which cities have derived from the installation of water meters is the reduction of this heavy waste during the winter months. With the introduction of water meters, consumers have realized the value of having water pipes protected from frost. This precaution usually entails very slight expense, but where there is no check on the water consumed a lack of public spirit keeps people from undertaking the frost protection.

Water and waste pipes should at once be carefully looked after and protected, and particularly so where they are exposed to cold drafts. They should be well wrapped and kept thoroughly dry on the outside. As an additional precaution, pipes may be enclosed in a box and well packed with sawdust.

The quantity of water wasted by a small stream left running under average water pressure is as follows:

1-32 inch leak wastes 8 gal. per hour.
1-16 inch leak wastes 34 gal. per hour.
 $\frac{1}{8}$ inch leak wastes 137 gal. per hour.
 $\frac{1}{4}$ inch leak wastes 514 gal. per hour.

On the basis of the local water rates, it is easy to figure out the actual cost to the city of these running faucets, and, also, the almost criminal neglect when compared with the small cost of overcoming this waste. Most installation is now recognized as one of the best means of preventing water waste. Where meters have been installed not only has it been followed by a marked reduction in the amount of water required for general consumption, but it has been possible to maintain a more satisfactory pressure for fire-fighting purposes.

WHAT ARE WE—PLUMBERS OR SANITARY ENGINEERS?

(Continued from page 23.)

only expose themselves to ridicule by adopting such a title.

The Royal Sanitary Institute, and the Institute of Sanitary Engineers of Great Britain hold examinations occupying two days both in Great Britain and her colonies, in sanitary science and engineering, which covers the subjects previously mentioned, and no candidate is eligible unless he has had considerable practical experience as well as profound technical knowledge.

The American Society of Sanitary Engineering demand practical qualifications and accept only such men in their society as are thoroughly versed in all the sciences which go to make up for efficiency. They endorse the efforts made by the various correspondence schools realizing the great good which is being accomplished by them to raise the standard of efficiency of the craft.

It goes without saying that the title "plumber" is not all that could be desired and that "sanitary engineer" is far and away superior, but before a person can conscientiously adopt the latter title he must realize the magnitude and importance of the work, also his responsibilities to the community and comprehend the necessity for continual study and perseverance in the subjects outlined in this little article.

Domestic Hot Water Supply Problems

A Series of Articles Dealing With the Problem of Hot Water Supplies, Range Boiler Connections, in Several Forms and Methods Adopted as a Means of Heating Water Under Various Conditions.

WHILE it would be next to an impossibility to show every method that may be adopted in connecting heaters, water fronts or coils to range boilers, there are one or two things which must be remembered in every connection. Elimination of friction should be aimed at as far as possible, all pipes should be run so as to rise from the upper outlet of either heater or water-front, and fall from the lower inlet to the bottom of the boiler, even though a coil is to be used which is inserted in a furnace, or when a tank heater is used. This was mentioned in a previous chapter. Then there is the question of the supply from the boiler to the various fixtures. It would astonish the average man to know how much water is wasted by the common practice of installing hot water supplies throughout the house for domestic service, without a circulation pipe, particularly when it is such a simple matter to prevent it, and in many cases even with an economy in piping. Just imagine a large apartment house without a circulation system, yet there are scores built and being built in that way. Another very common error is made when the sanitary engineer wishes to install a neat job, and starts to run the hot and cold service pipes all under the floors. See Fig. 1. It will be noticed that if the pressure is not very great there is a possibility of air-lock and further, it is impossible to drain all the water out of the pipes. It is next to impossible to even empty the boiler without disconnecting the hot water pipe at the boiler coupling. Of course such a system could be adopted if there were any fixtures below, or say in the basement. Then by the opening of the hot water taps at each fixture the objections mentioned would be overcome. There would still, however, be the question of circulation, which would require an overhead pipe. It is very poor practice to sacrifice efficiency for imaginary neatness. Of course, this particular system shown in Fig. 1 could be improved by running a pipe into the wall (providing the wall was not on the outside of the building), and carrying it horizontally between a partition until the pipe to the upper fixture was reached, then cutting out the vertical piece which is shown at side of boiler, and connecting the pipe which runs below the

floor to the lower pipe on the range connection. See Fig. 2. The circulation pipe has been known to come in for some little criticism when there has been a fixture in the basement taken off the return line as shown in Fig. 2, the reason being that on account of the fact that the water was always circulating, there was a quantity of dirt and rust, etc.,

simply turning on the hot water tap, whereupon out came a lot of rusty water, which was not noticed at the time, owing to the place being rather dark. This trouble may easily be overcome by placing a tee at the lower end of the pipe with a tap on, as shown, and attaching a tag with the instructions to drain water off before using the hot water at

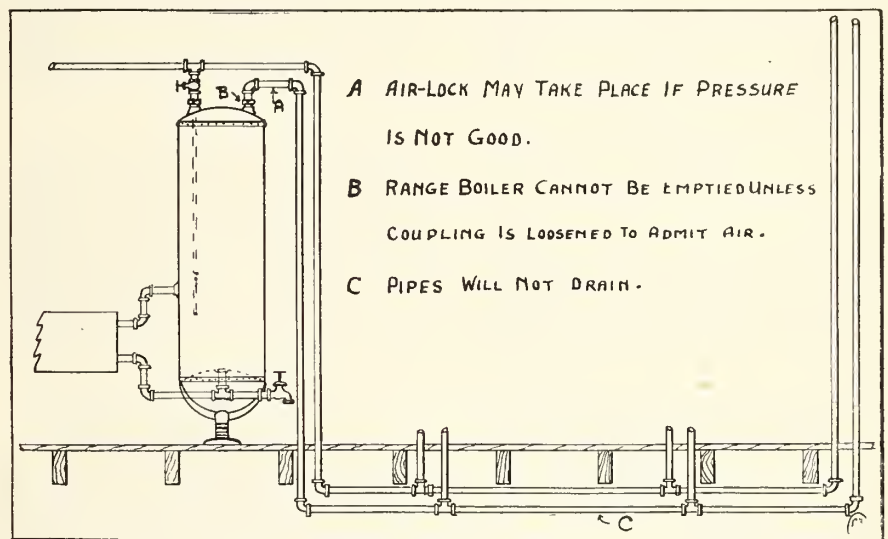


Fig. 1.

carried along through the pipe and finally deposited in the pipe which supplied the lower fixture. The writer had an experience of this kind which resulted in a lot of white household linen being rust-stained owing to the maid

the lower fixtures, such instructions would also be instrumental in providing a cleaner supply of hot water throughout the whole building, which could not help but be appreciated by the occupants.

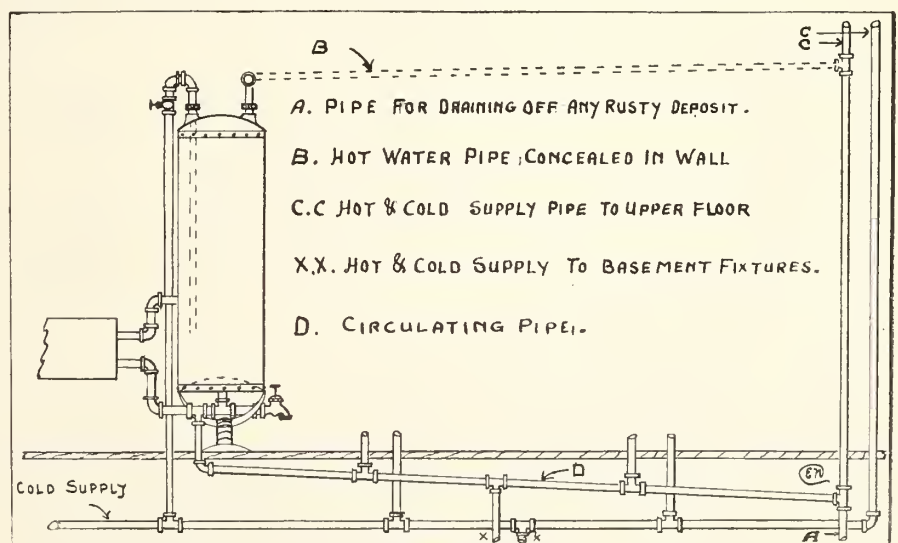


Fig. 2.

Practical Course for Sheet Metal Workers

Article No. 7 of Series

By CHARLES SEIVERS.

Fig. 1.

ON a given line, to construct an isosceles triangle, having a given vertical angle.

In Fig. 1 let the angle at A be the given angle and the line B C the given line.

Extend the line B C to D and at B make the angle D B E equal to the given angle at A.

Bisect the angle E B C and through this point draw the line B F. At C make the angle B C A equal to F B C. When this is completed the triangle F B C is the required isosceles triangle.

Fig. 2.

To construct a square on a given line.

In this problem let A B be the given line; at one end, as at A, erect a line at right angles to A B, as A D. Make this line equal in length to A B, by drawing an arc with A as a centre, and A B as a radius.

With the same radius and with B and D as centres, draw two other arcs to join at C. Then draw lines joining D C and C B.

The square outlined by A B C D is the square required.

Fig. 3.

To construct a square on a given diagonal.

In this problem let A B be the given diagonal. Bisect A B in C by the line D C at right angles to A B. With E as a centre and E A or E B as a radius draw a circle to cut through the line D C.

Then draw lines joining A C, C B, B D and D A.

It will be seen that A C B D is the required square.

Fig. 4.

To construct an oblong when the length of its sides are given.

In this problem let L and S be the length of the two sides.

Draw the line A B, making it equal to L. At A erect a line at right angles to A B, making it equal in length to S.

With B as a centre and a radius equal to S draw an arc. With C as a centre and a radius equal to L, draw an arc cutting the one drawn from B, at D. Next draw a line joining C D and B D. And the figure A B D C is the required oblong.

Fig. 5.

To construct an oblong when the

diagonal and the length of one of its sides are given.

In this problem let L be the given diagonal, and S the given side. Draw a line as A B, making it equal in length to L. Bisect this line as at E; with E as a centre and E A or E B as a radius draw a circle.

From A and B as centres and with a radius equal to S, draw arcs to cut the circle at C and D. Then draw lines joining A C, C B, B D and D A.

The figure outlined by A C B D is the required oblong.

Fig. 6.

To find the centre of a given circle.

In this problem let A B D be the given circle. Draw a chord as shown at A B. Bisect this chord and extend the bisecting line to cut the circle at two points, as at C and D. Next bisect the line C D as at E, and E will be the centre of the circle.



THE FIRST CUSTOMER.

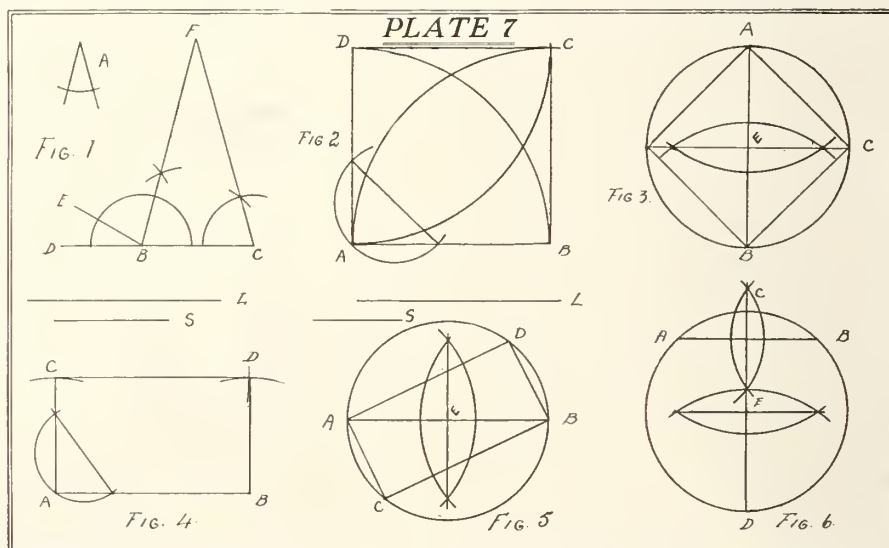
If there is one customer that comes into your store that requires more careful attention than any other it is the first-timer. At all times there should be courtesy and prompt attention, but there are little things which the old customer who is well acquainted with the store and the staff will overlook which will make a strong and unfavorable impression upon the man or woman who comes into the store for the first time.

They are susceptible to the slightest influence.

Perhaps the stranger may look like an out-of-date farmer, who may be seeking credit until the harvest, perhaps he is a new representative from a wholesale house or manufacturer, perhaps he is a passerby who wants to use the phone or spends a few cents and does not come near the store again—but if he comes to your store for the first time give him the best of your service.

There are few who have not been swung to patronize a store by the service given on the first visit. With a new comer who has no knowledge of the town or city it is ever thus. The man who enters a store for the first time, sees a couple of clerks look at him and then turn their backs and go on packing goods or start an argument as to whose turn it is to go "front" then finds himself waiting uncomfortably for some minutes while the clerk gets ready to come forward to wait on him, is likely to walk out of the store and never come in again. If on the other hand he is received as though he is welcome to the store and as though his business was appreciated he is pretty certain to come back again.

Occasionally it will be found that the smile of welcome is wasted on desert air—that is an element of chance in salesmanship—but if a store is to enlarge its circle of trade one of the most important influences will be the first impression of the prospective customer.



In developing the above problems we suggest that the student make his drawings four times the size of the above sketch.

Heating and Ventilation Past, Present and Future

These Articles Will Take up the Simplest Methods Adopted in the Past, the Present and the Possible Methods for the Future, and Will be Written as Free From Technical Phraseology as Possible, so as to be Within the Scope of the Lay Mind.

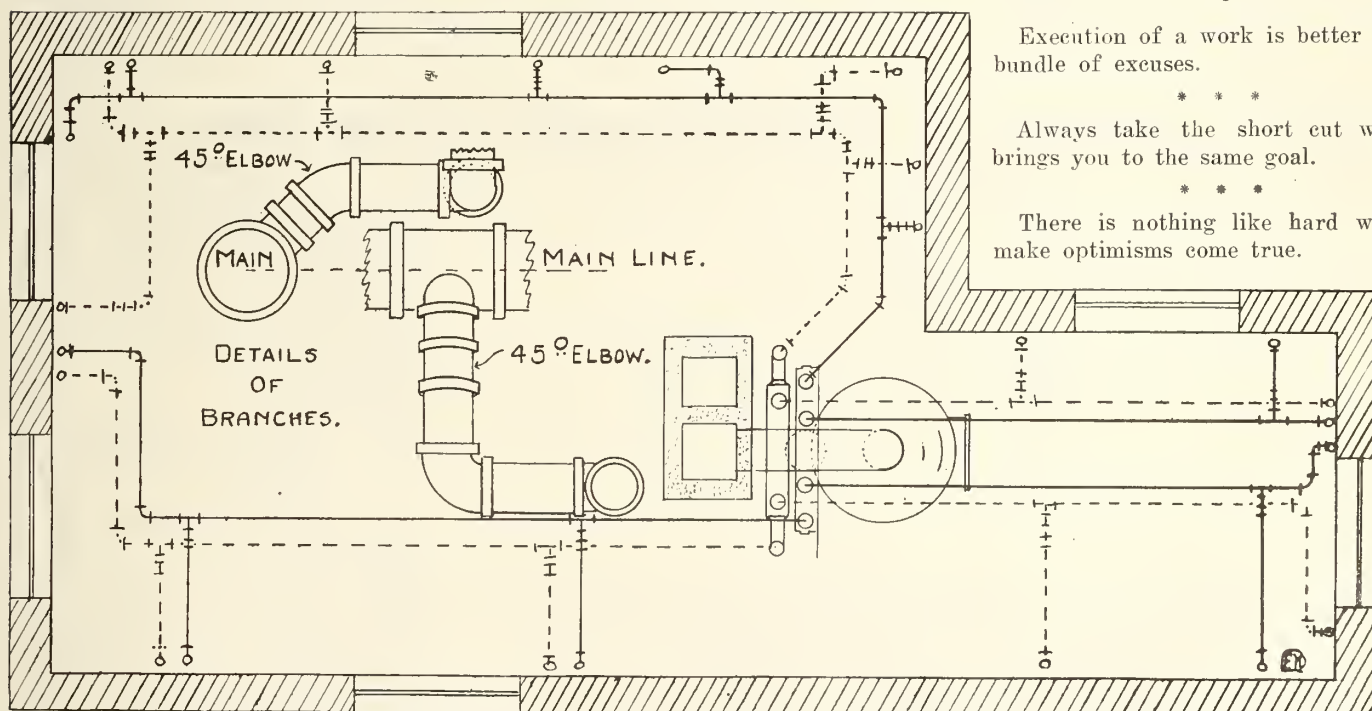
THE most popular system of heating adopted for residences is that of hot water. Some of the oldest installations are still to-day doing good service. There is however not the variety of systems and methods of installation that there is with steam systems. Hot water systems may be one pipe, or two-pipe open gravity, or two-pipe closed systems, pressure systems or systems controlled as it were by popular generators.

The method shown below is simply an ordinary two-pipe system. Almost every two-pipe system, whether open or pressure, is piped in the same manner. There are generators which are very effective, and in such instances there may be slight variations as to the method of taking branches off the mains. We will describe some of the most popular generator installations at a later date. It has often been asked by the ordinary workman how it was possible for flow and return to give anything like efficient service from a twin connection hot water radiator when the two pipes were so close together, and practically joined at the first section. The answer is, of course, that the hot water will rise rapidly as soon as it reaches the radiator, and the moment this water begins to cool it falls

and arrives at an outlet which gives off the least resistance. Of course, it can be safely asserted that the twin radiator is not by any means the most efficient.

The writer has changed several installations and placed the feed to the top of the radiator and return at the bottom, which method has been found to be far more efficient than the twin connection. The same argument can be used with steam radiation. The steam radiator is not as efficient as the hot water because of its construction. If a hot water radiator is used on a steam installation it will be found far more efficient. A method in hot water residence heating, which has been found to give good service, is to take mains off the boiler for each floor separately. For instance, suppose the ground floor could be heated by using two 2-inch mains, just heat that floor only from them; then if the second floor required, say, one 2-inch and one 1½-inch, then only use these two mains for that floor. The same with the attic. Such a method being adopted, it would be impossible for one radiator on an upper floor to rob or short circuit a radiator on a lower floor, because of there being no connection between them. Another custom which is becoming very general is that of piping

a hot water system without valves on the flow and return at the boiler. If the owner of a building were to be shown the great advantage of having valves installed with drain valves, there would be more installation with these valves on than there is at present. Just a few weeks ago the writer was in conversation with the owner of a residence which has been built this last summer, who was surprised to be told of such a plan. This owner promptly decided to have valves placed on the installation after the winter is over. Several winters ago the writer was called in to take out a large radiator which had become frozen and cracked. The weather was 30 below zero, and the whole system had to be emptied because of there being no valves on the system; this is a common occurrence. A bank building fared the same way not very long ago. In fact, for the sake of a few valves such a system is absolutely uncontrollable, while if valves are installed it is possible to make almost any repairs as well as to regulate the system by checking or opening up the valves. Then, again, there is the extra remuneration for installing them, as well as the establishment of a reputation for the one who does the work.



Execution of a work is better than a bundle of excuses.

Always take the short cut when it brings you to the same goal.

There is nothing like hard work to make optimisms come true.

Showing an imaginary piping plan of hot water system, with details as to how all branches should be taken off mains and returns.

Sanitary Engineers Should Create New Business

Plan Campaigns to Keep Business Moving At All Seasons of the Year—Point Out to Employees How This Can Be Done By Noting the Condition of Fixtures at Each Job They are Sent Out to.

SANITARY and heating engineers do not as a rule plan ahead for new business. One of the finest ideas that has come to our notice is worked out in the following manner: When an order has been received, whether by mail, phone or from any other source, at the moment it is immediately entered in the order book and given a number. A time and material sheet is issued as soon as the job is started, the sheet is given the same number as the job, and everything is entered on this sheet. If the apprentice is sent to the shop for anything for the job, it is entered on the time sheet, etc. The best point in this sheet, however, was the column under heading "remarks." The workman is instructed to take note of the condition of the various fixtures. As an example see reproduction, Fig. 1. If the furnace happened to be in bad condition, he reports under heading "What the conditions are," whether covered or not as well as the piping. The same with the w.c. tank or any other part of the w.c., basin, sink or laundry tub. Then, when work seemed to be likely to run short, either the employer or foreman would make a call. For instance, let us examine the sheet, Fig. 1., Job No. 65. Employee No. 25. It will be seen how the material and time is charged, and under "remarks" it will be seen that the furnace was hot water, not covered, the ball cock leaking.

etc. The same system could be carried out with every piece of plumbing or heating. Such information is bound to be very valuable if a personal call is made later on. For instance, the employer or foreman could call with the account for the job done and at the same time call the owner or householder's attention to the condition of the various appliances, and in nine cases out of ten some new business will be procured. Even if not successful at the time, it could be pointed out that as note had been taken of what would be necessary in case the owner or householder desired at a later date to have the work done, the workman would be properly instructed what to do, and would bring material and tools on the first visit, thus saving time of sending or going back to the shop for them.

One of the reasons why quite a large number of sanitary and heating engineers are not very busy at certain seasons of the year is because they do not plan for new business. We hear of hardwaremen studying the lines they sell at various seasons of the year; dry goods men too, and quite a number of other business men cater to the public wants, but very seldom do we hear of a business campaign being carried on by sanitary and heating engineers. Of course we know many of them do not carry stocks for display, but why not? The reason the average hardware merchant handles such a quantity

of sanitary and heating fixtures, is because of the demand, and if there is a demand, it is far more natural for a person requiring a sanitary fixture, to go first to the establishment of a sanitary engineer. Another phase of this subject may be mentioned, that of quality. The average hardware merchant cannot be expected to know the difference between a cheap line of brass goods and a first-class article, in fact it requires an A1 practical man to know this. The trouble with most merchant sanitary and heating engineers is that they do not carry the variety of stock. We do not mean a big variety of baths, w.c.'s or lavatories, etc., is necessary, but at least smaller lines, such as furnace accessories, sanitary kitchen utensils and bath-room novelties, and such like might be carried. The writer has in mind several sanitary and heating engineers who began business in that way and are to-day conducting some of the largest establishments in Canada.



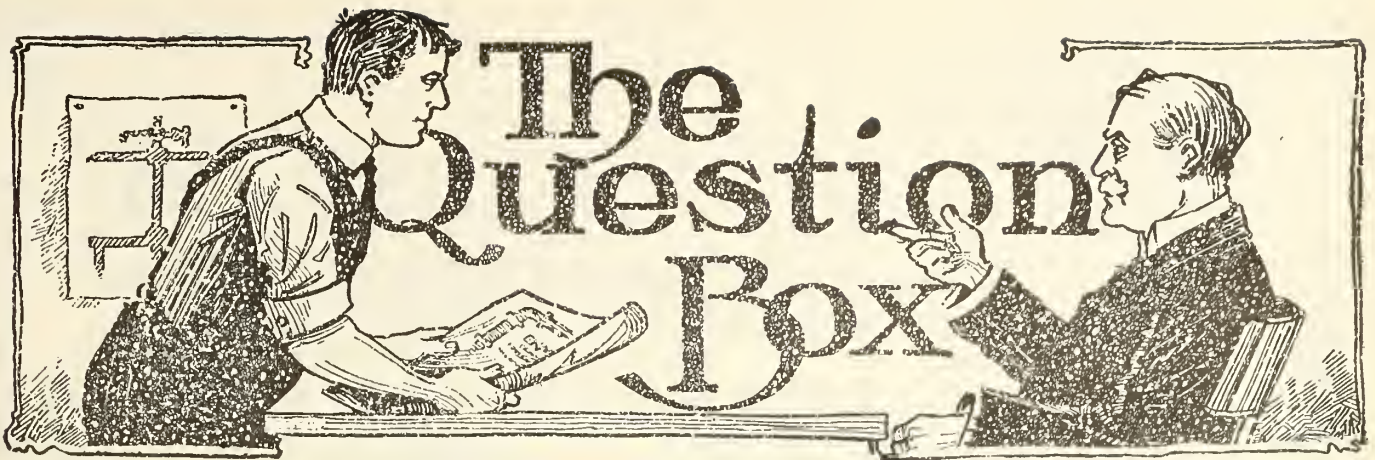
The man who waits for outside forces to drag him up into a higher place will never get any higher than he is right now.

* * *

If there is any branch of work in the handling of your business in which you are yourself deficient, get expert assistance before you lose too much money.

Job No. 65 Employee's No. 25 WILLIAM JONES, Sanitary and Heating Engineer			
DATE	TIME	MATERIAL	REMARKS.
1914 June 10	3½ Hrs.	4 ft ½ in Lead Water pipe 1½ lbs Solder 1 Pint Gasoline 4 Car Lockets 2 ½ in Pipe Clamps	Condition of Furnace, Etc. Hot water not covered. Fire door broke then smoke pipe wanted W.C. Ball Cock leaking Bath Copper lined in bad condition Lavatory marble slab bowl loose Sink Laps leaking old cast iron
1100 Watwell 65 Westbrook Rd Repair water pipe			

Suggestion for time card, showing it duly filled out.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

Steam Pump and Condensation.

Editor The Sanitary Engineer:

I should feel much obliged if you would kindly answer the following queries:

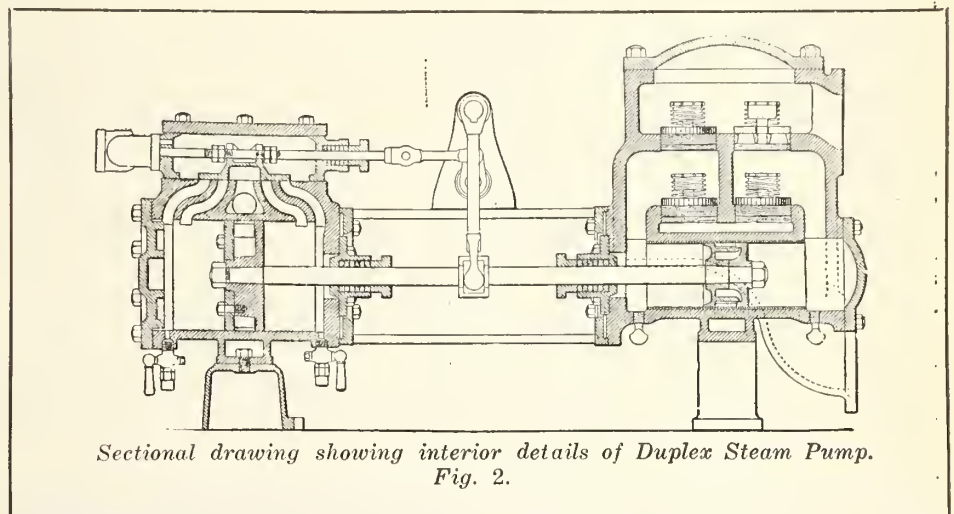
(1) How is it possible for a pump receiving, say 60 lbs. steam pressure from a boiler, to pump back the condensation into the boiler when the pressure meets it. (See sketch)).

(2) How does a gravity system work re returns getting back into the boiler. How can it force itself back?

(3) What is the air-line used for? How does it work? How is the vacuum produced without a pump? Could you show a diagram from radiator back to wherever it goes?

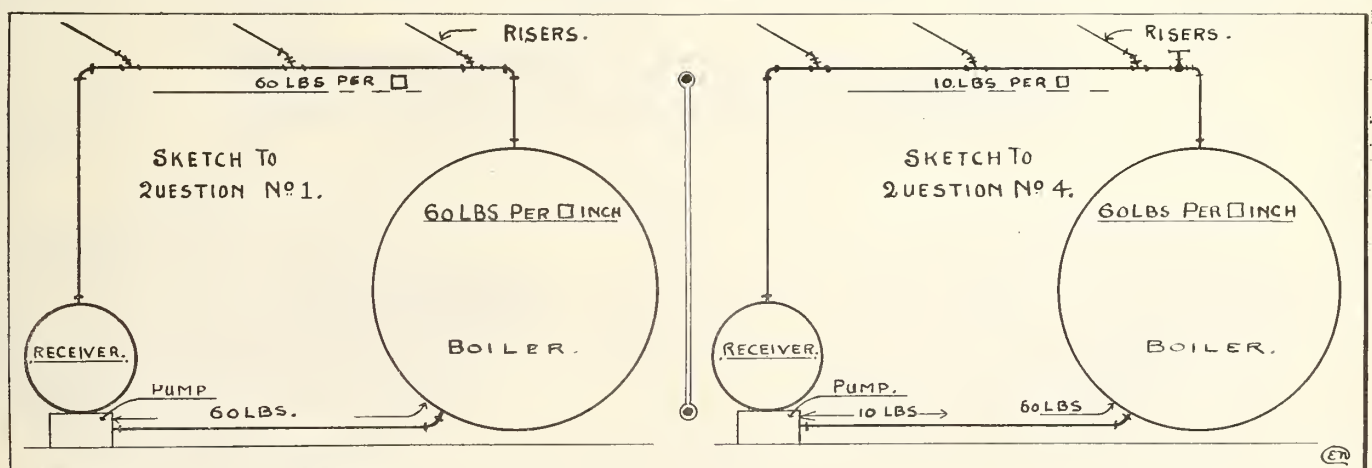
(4) Where the steam pressure is 60 lbs. per square inch in boiler and is reduced to, say, 10 lbs., how can gravity or the pump force it back into boiler. (See sketch)?—Inquisitor.

Answer to question.—The reason why a steam pump will operate as it were, against its own pressure is this: All such pumps have a steam cylinder and piston of a larger diameter than that of the water cylinder and plunger. For instance—Note Fig 1. The water end is



say 6 inches in diameter and the steam end 10 inches in diameter, at 60 lbs. pressure the steam end would have a pressure in volume of 4,700 lbs. This is arrived at by multiplying the total area of diameter, $78\frac{1}{2}$ square inches by the 60 lbs. pressure. The wider end being 6 inches in diameter, it has an area of $28\frac{1}{4}$ inches, therefore will have about 1,700 lbs. volume. It will be seen that the steam end has 3,000 lbs. greater

volume than that of the water end. These are the approximate figures without going into decimals. Fig. 2 shows an outline drawing of a duplex steam pump which gives the reader a fair idea of the approximate size of both steam and water end. For the information of our readers we may state that it is a very interesting experience to install one of these pumps. The most vital point is to be sure to eliminate all friction possible



between the water end and the boiler, and when it is necessary to install a swing check valve, always use one a size larger than the size of pipe and bush each end. By so doing the clock on the valve will open up wider than if check valve the same size as the pipe is used. Another point to watch is to provide as dry steam as possible. The writer always found it to be good practice to place a check valve about 3 times the length of the stroke of pump, from the pump on the horizontal.

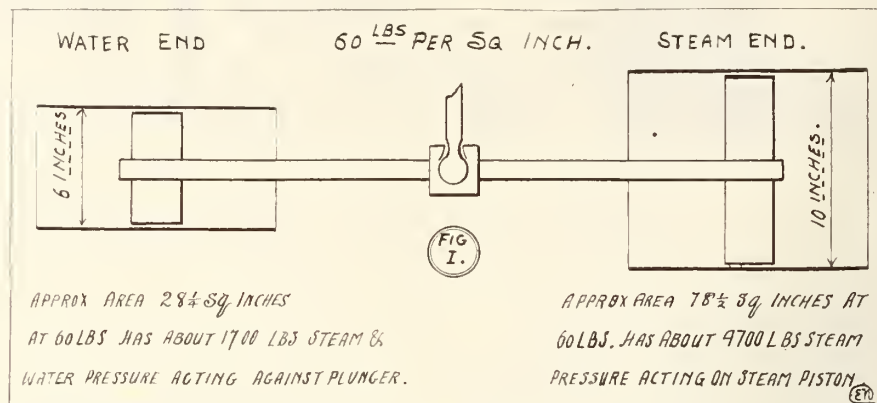
Answer to question No. 2.—There is, as our readers know, a great deal of difference between the specific weight of steam and water, the water being heaviest will always find its own level irrespective of what pressure there be on a steam system, that is of course providing the installation is properly constructed. There are conditions, such as on a poorly laid-out one pipe systems when a radiator has been known to hold water, then when the steam has been raised too high, the water could not return. Fig. 3 shows two systems of steam heating, viz., a one-pipe system with dry return and a two-pipe system with wet returns. While these two systems are shown connected to one boiler, it is not meant to be a complete installation, but simply to illustrate the two methods of piping, showing how the two systems differ from each other. The piping for the one-pipe system would require to be one size larger.

We will answer question No. 3 in our next issue.

Answer to question No. 4.—While this question is not quite clear we presume that what our correspondent wishes to know is "If the pressure at one end is reduced from 60 lbs. to 10 lbs. how could the pump receiving only 10 lbs. of steam pressure pump the condensation into a boiler with the pressure standing at 60 lbs. This could be done, but would not be a practical proposition. If our cor-

respondent will look at Fig. 1 he will see that it would require a pump with an extraordinary sized steam end to do the work, and the volume of steam at 10 lbs. pressure would be out of all proportion. We would rather have a separate steam pipe carried from the boiler direct to the pump and in that way better results would be achieved. We have never heard of any heating system being installed as shown by the sketch submitted by our

install a heater in the fire-box of the furnace and a 50-gallon boiler, and for the life of me I can't get the water hot enough. The strange part of this is, I have done a job exactly the same size, except that all the buildings are up—that is, the whole four stores and apartments, the same size of furnace, and same size of ranges, boiler and heater in the furnace, and the job is working fine, and here I am with a job with only half



correspondent. In our next issue we will show the layout of a steam heating system where the exhaust from an engine is utilized to heat the building.—Editor.

Does Not Heat Water in Range Boiler.

Editor The Sanitary Engineer:

Last summer I received a contract to install a hot water heating system to heat four stores and four apartments above. The apartments were so arranged as to be used separately or in conjunction with the stores. However, when the war broke out, the owner decided to build only two stores and two apartments, and asked me to supply and install a large enough furnace to heat the whole of the original plan and provide outlets to go on with the work when he was prepared to finish the premises as originally planned. I was also asked to

the load on, and it will not heat. Can you suggest any way to help me out of the trouble?

A Subscriber.

As our correspondent did not send us any sketch of this installation we can only surmise what may be the trouble. The fact that one job is giving good results, even though at full load, and that the other is only at half load or so, would lead us to come to this conclusion:

The furnace where there is a poor supply of water does not require to be fired as hard; the chances are there is no need to have coal more than half the depth in the fire pot, and the heater, we presume, is too far away from the body of coal, and does not get as fierce a heat as in the job where it is necessary to keep a full fire pot, because of having a full load of radiators on the furnace.

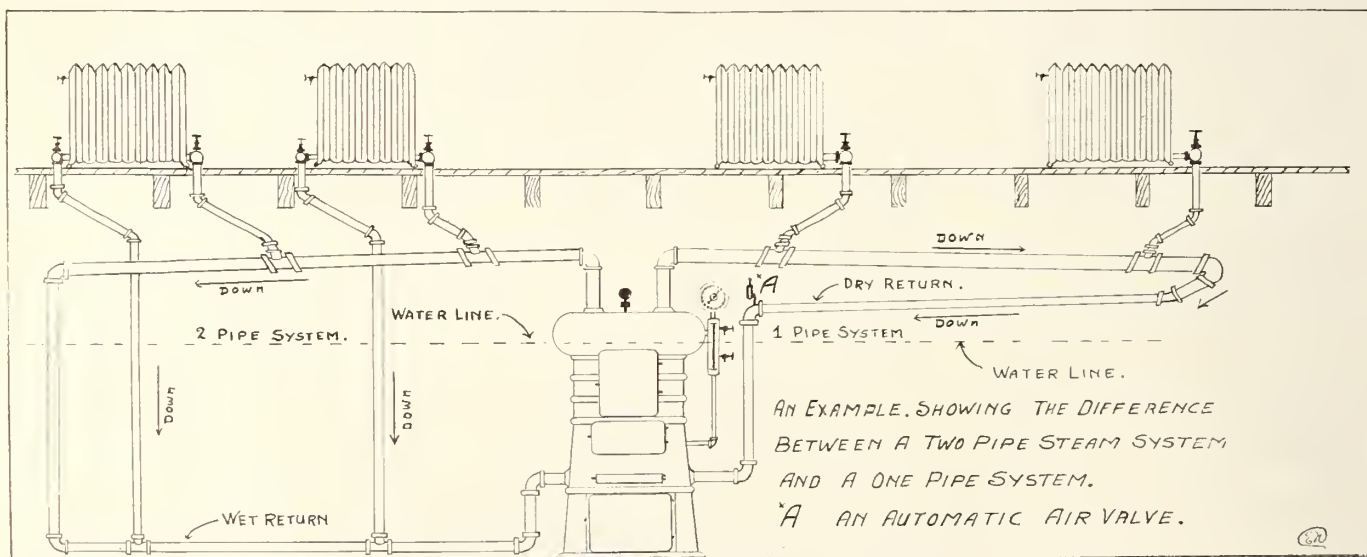
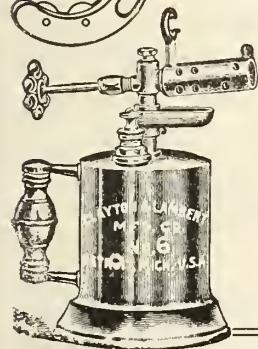
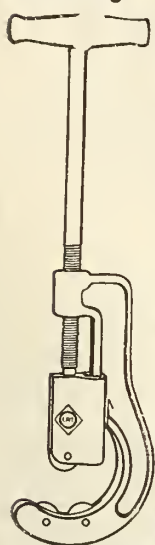
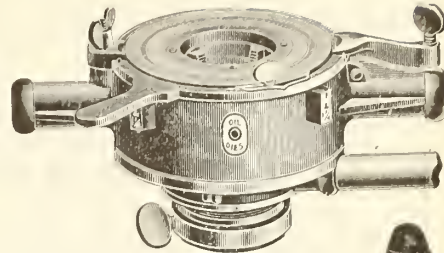


Fig. 3.



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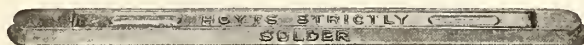
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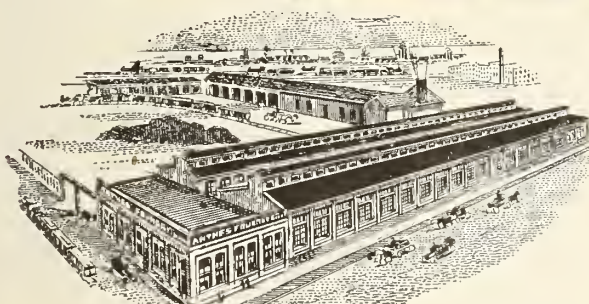
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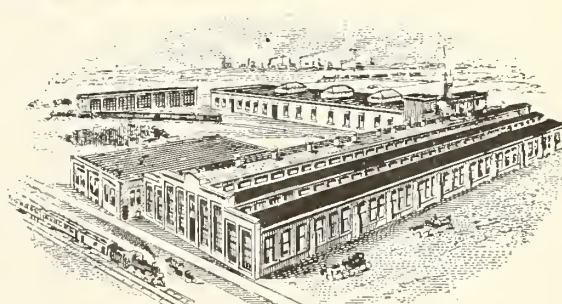
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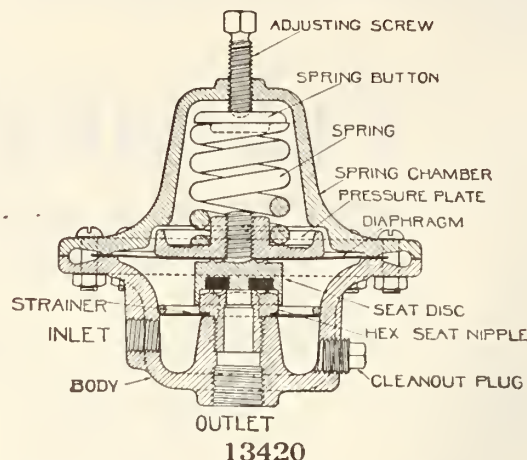
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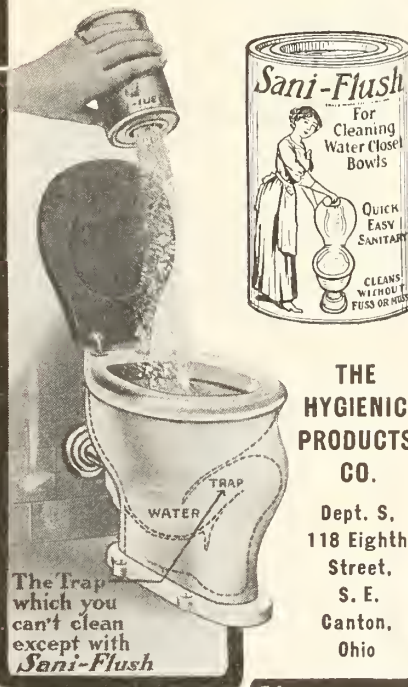
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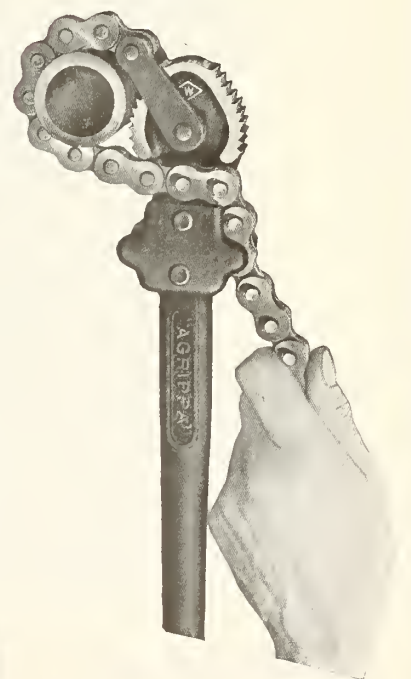
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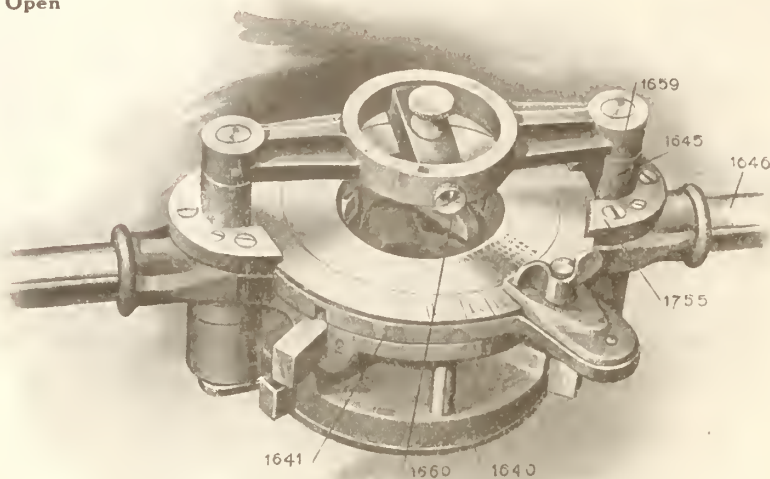
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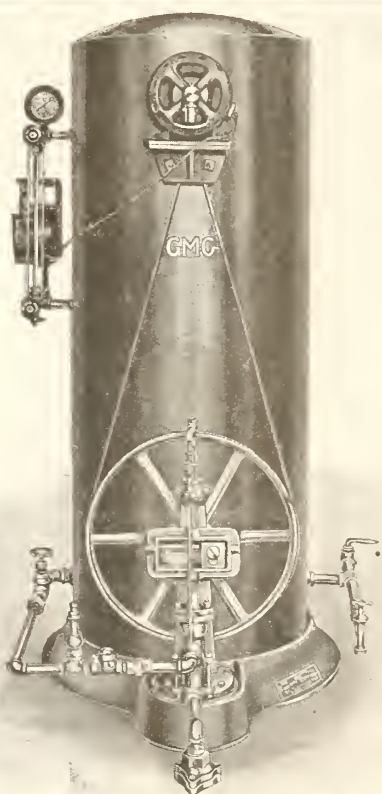
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We are now furnishing our "G.M.C. Special" Automatic Electric System, as in cut, with our new Ball-Bearing Pump — Capacity 200 gal. per hour. It is operated by a one-quarter horse-power motor. The Pump itself will supply a sprinkler without the aid of the tank.

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NOW IS THE TIME to show your patriotism, and prove to yourself and others, that VALVES, made in Canada, are equal in quality and workmanship, to any made elsewhere in the World.

BREAK THE HABIT of buying foreign-made goods and get acquainted with Canadian Made valves, which you have perhaps imagined were not quite equal to the Imported variety.



REMEMBER that every dollar spent in Canada for Canadian manufactured goods, means increased consumption of raw materials, and increased employment of Canadian labor.

Quickest possible deliveries.

Consistent Prices.

This plant is at your service.
Help us keep it busy.

Write for Catalog No. 5.

Best quality of goods.

The Kerr Engine Company, Limited Walkerville, Ontario
Valves and Hydrants Exclusively

"MADE-IN-CANADA"

Mr. PLUMBER:

You cannot afford to risk your CUSTOMERS' CONFIDENCE by installing any article you cannot GUARANTEE.

The BRASS TRIMMINGS attached to your fixtures have to stand the constant wear, and therefore constitute a MOST IMPORTANT part of your installation.

The "PERFECTO"^{TRADE MARK} line of Brass goods will absolutely satisfy your most particular customers.

BECAUSE:

- They are made of Red Metal
- " " Accurately Machined
- " " Very Attractive in Design
- " " Tested

Guarantee

ANY ARTICLE OF OUR MAKE, PROVING DEFECTIVE THROUGH INFERIOR METAL OR IMPROPER WORKMANSHIP ON OUR PART, WILL BE REPLACED WITH TWO GOOD ONES AT **NO CHARGE** TO YOU.

GALT BRASS CO. Limited

GALT BRASS COMPANY, LIMITED
GALT, CANADA

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